NEW REMEDIES

AN ILLUSTRATED MONTHLY TRADE JOURNAL

637

OF

Materia Medica, Pharmacy and Therapeutics

FRED'K A. CASTLE, M.D.,
PHYSICIAN TO THE PRESBYTERIAN HOSPITAL AND TO THE DEPARTMENT FOR MEDICAL AND SURGICAL RELIEF OF OUT-DOOR POOR,
EDITOR

CHARLES RICE, PH.D.,
CHEMIST OF THE DEPARTMENT OF PUBLIC CHARITIES AND CORRECTIONS, ETC.,
ASSOCIATE EDITOR

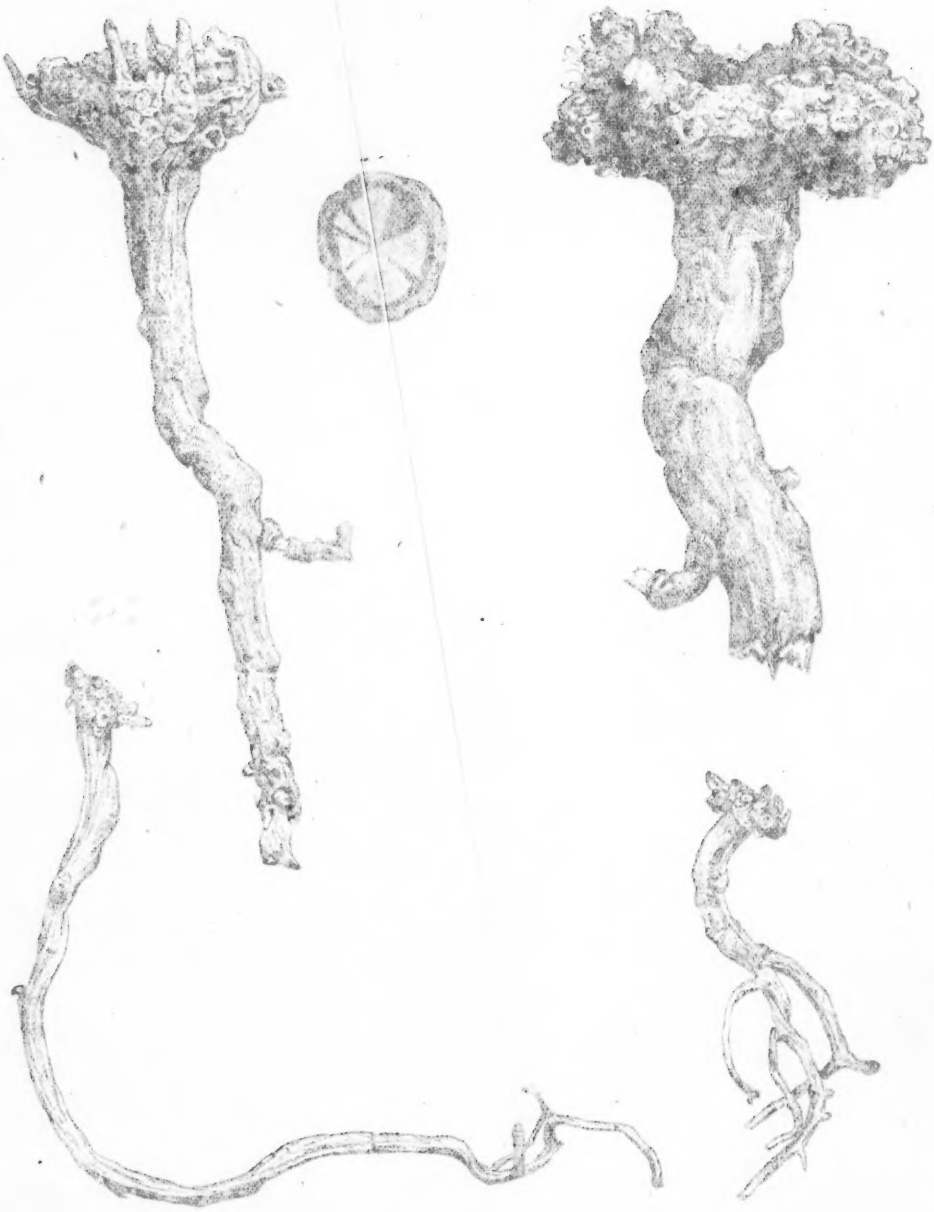
VOL. XI

Azor Thurston

WILLIAM WOOD & COMPANY
PUBLISHERS
56 & 58 LAFAYETTE PLACE, NEW YORK
1882

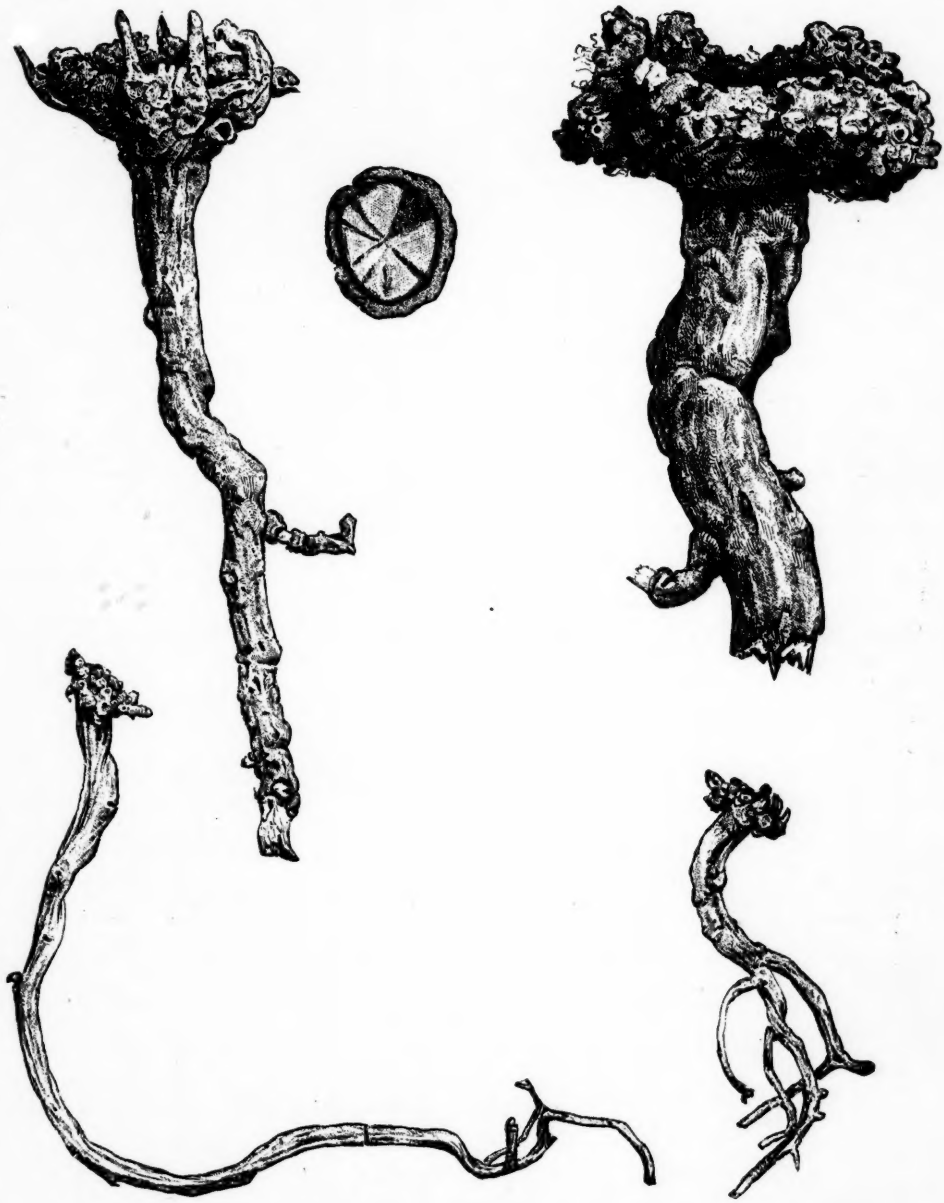
OHIO STATE
UNIVERSITY

New Remedies; an Illustrated Monthly Trade Journal.
New York, January, 1882.



COMMERCIAL SENEGA.

NEW REMEDIES; an Illustrated Monthly Trade Journal.
NEW YORK, January, 1882.



COMMERCIAL SENEGA.

RSR
AE15
v.11

NEW REMEDIES.

VOL. XI. NO. 1. JANUARY, 1882. WHOLE NO. 91.

Senega.

THE engraving which we present as a frontispiece to this number of NEW REMEDIES, represents in natural size dried specimens of large and of ordinary senega, exhibited by the Messrs. Lloyd at the recent meeting of the American Pharmaceutical Association, at Kansas City.* The two lower figures are familiar, and represent good-sized specimens of ordinary senega, one being from Kentucky, the other from Indiana. The upper specimen on the left represents large (Northern or Western) senega, and was taken from a bale of about two hundred pounds, being the average size of that lot, although some was much larger. The knotty head and part of root (right upper corner) was taken from a lot of several hundred pounds, the entire amount consisting of knotty heads of about the size of our engraving. The history of this lot is that the great size forbade its disposal as senega, therefore, the small roots and rootlets were separated and mixed with small specimens of Northern senega, while the "knobs" were sold at a sacrifice. We represent a section in natural size of the root of Northern senega, but, as a rule, this senega does not show the rayed woody centre so marked as in our engraving, if at all. For many years, a cloud has, to say the least, hung over the large senega of commerce. Few could view the great fleshy roots we have represented, and believe that the species yielding them could be the POLYGALA SENEGA *Linn.* However, the history and source of this senega is now before the public, and the next point to be settled is its therapeutic value as compared with the POLYGALA SENEGA *Linn.* and its variety *latifolia* of more southern growth. The heads of recently gathered senega are covered with a mass of small shoots and leaves. The engravings we present show only the actual woody portion; were the entire heads shown, they would be fully twice the size of our figures. In conclusion, we will say that the artist has been true to Nature, and that the illustrations of Northern senega are as accurate and characteristic as those of the familiar Southern senega.

Cinchona Cultivation in India.

ACCORDING to the official report of the East India government, on the cinchona cultivation during 1880–81, the planting of cinchonas in Sikkim was restricted to those with yellow bark and to the supposed hybrid, which had at first been regarded as a hairy variety of *Cinchona officinalis*, but is now reckoned by Howard to *Cinchona conglomerata*. In the two plantations at Mungpo and Sittong, no less than four millions of red cinchonas are already growing, and no more have been planted. Of the hybrid form, 85,230 are planted out at Mungpo, and 5,000 in Sittong, which brings the grand total of this variety in both locations up to 199,898. Of the exceedingly valuable *Ledgeriana*, 99,415 trees have been planted at Mungpo, and their number is to be considerably increased. Unfortunately, the attempt made in Java to graft the Ledgeriana upon succirubra has been a failure. The trees imported in January, 1880, from Colombia promise good results. The total yield of the plantations in 1880–81 was 377,525 pounds of dry bark, against 361,590 pounds in 1879–80, and 261,659 pounds in 1878–79.

* A paper entitled "The Senegas of Commerce," by J. U. and C. G. Lloyd, Cincinnati, Ohio, published in full in NEW REMEDIES, October, 1881, page 290.

[ORIGINAL COMMUNICATION.]

Notable Accidents.

BY PROF. JAMES F. BABCOCK, BOSTON.

THE following are some of the particulars relating to notable accidents or explosions, by which chemists lost their lives or were seriously injured. These are all of modern dates, for violently explosive substances (chloride of nitrogen, fulminates, etc.) or poisonous gases (chlorine, arsenetted hydrogen, etc.) were unknown to the ancients, with the single exception of sulphurous vapors, which Homer* mentions as a means of fumigation, and which were employed by the shepherds to bleach their wool, as related by Ovid.†

It was by suffocation with this gas that Pliny the Elder lost his life, August 25th, A.D. 79, during an eruption of Vesuvius. The account of the circumstances attending his death is given by his nephew, Pliny the Younger, in an epistle to Tacitus the historian.‡ He tells us that his uncle was in command of the Roman fleet, at Misenum, and that observing a cloud of unusual size and shape arising from the mountains in the direction of Vesuvius, a phenomenon which he deemed worthy of closer investigation, he took his tablets with him, and ordering a light vessel, proceeded across the bay to Stabiæ, to the house of his friend Pomponianus, who had already become alarmed, and was making preparations for flight.

Pliny assured his anxious friend that there was no danger, and to show his own sense of security, requested his servants to conduct him to the bath. After the bath he dined, and later, retired to rest and soon feel asleep. "In the mean time," writes his nephew, "vast sheets of flame and large bodies of fire were to be seen arising from Mt. Vesuvius, the glare and brilliany of which were beheld in bolder relief as the shades of night came on apace. . . . The courtyard, which led to his apartment, had now become filled with cinders and pumice-stones to such a degree that, if he had remained any longer in the room, it would have been quite impossible for him to leave it. On being awoke, he immediately arose and rejoined Pomponianus and the others, who had in the mean time been sitting up. They then consulted together whether it would be better to remain in the house or take their chances in the open air, as the building was rocking to and fro from the violent and repeated shocks, while the walls, as though rooted up from their very foundations, seemed to be at one moment carried in this direction, at another in that. . . . It was then determined to make for the shore, but the sea was still too boisterous to allow of their making the attempt to embark. Upon this my uncle lay down on a sail which had been spread for him, and more than once asked for some cold water, which he drank. Very soon, however, they were alarmed by the flames, and the sulphurous smell which announced their approach, upon which the others at once took to flight, while my uncle arose, leaning upon two of the servants for support. Upon making this effort, he instantly fell to the ground; the dense vapor having, I imagine, stopped the respiration and suffocated him, for his chest was naturally weak and contracted, and often troubled with violent palpitations. When day was at last restored, the third after the closing one of his exist-

* Odyssey, xxii., 494.
† Fasti, iv., 739.
‡ Plinii Epist., vi., 16.

318355

ence, his body was found untouched, and without a wound; there was no change to be perceived in the clothes, and its appearance was rather that of a person asleep than of a corpse."

Passing now to the middle of the last century, we find the case of Lehmann (J. G.), professor of chemistry at the Imperial Museum of St. Petersburg, who died in 1767 from the inhalation of the fumes occasioned by the explosion of a crucible in which an arsenical mixture was being strongly heated.*

In 1788, Berthollet proposed to substitute the chlorate of potassium for the nitrate in the manufacture of gunpowder, and an experiment was made at the government works at Essonne. Twenty pounds of the chlorate were mixed with charcoal, and while the operation was going on, a terrible explosion took place, instantly killing M. Letors, director of the works, and a young lady (Mlle. Chevrand), who had accompanied him. Berthollet and Lavoisier were both present, but escaped injury as by a miracle.†

Pelletier, the elder, in 1790, was severely wounded in both eyes by an explosion produced by the action of nitrous gas upon phosphoretted hydrogen, a mixture which he had incautiously made in a glass receiver.‡ Pelletier died at the early age of thirty-six years, of consumption, induced by the breathing of vapors of phosphorus and chlorine—the combinations of these elements with the metals having been a special study with him for several years previous to his death.§

In 1808, Barruel, at that time assistant to Thénard at Paris, had a portion of his right hand blown off, by an explosion of fulminating mercury which he was carelessly rubbing in an agate mortar. The following year (1809), Figuier, professor of chemistry at the school of pharmacy at Montpellier, was the victim of a similar accident. He had prepared for his lecture about sixty grains of fulminating silver, which he had placed in a glass-stoppered bottle. The slight friction developed by the attempt to open the bottle, caused an explosion of the fulminate which destroyed one of the eyes of the unfortunate chemist.

In 1808, Gay-Lussac was preparing potassium on a considerable scale, when a fragment was suddenly projected from the apparatus, and struck him in the eye. He received the care of Dupuytren and for a month believed himself blind.‖

In 1811, Dulong was severely wounded by an explosion of chloride of nitrogen, which he had at that time but recently discovered. All the glassware in his laboratory was broken, and he was compelled to suspend his investigation until the following year. In 1812, while continuing his experiments upon this dangerous compound, a still more disastrous explosion took place which caused him the loss of an eye and two fingers.¶

The same year Davy met with a similar though less severe accident. A tube containing a small quantity of chloride of nitrogen was suddenly shivered to atoms and he received a wound in the cornea of the eye, which was followed by inflammation, disabling him from further immediate experiments. In July, 1813, he attempted the analysis of this substance by the action of mercury, when a violent detonation occurred and he was again wounded in the head and hands. His injuries on this occasion were comparatively slight, as he had taken the precaution to defend his face by a plate of glass attached to a proper cap.**

Faraday was at this time an assistant to Davy, and on one occasion was holding a small tube containing a few grains of the chloride of nitrogen, between his finger and thumb, when he was stunned by its sudden explosion, and on returning to consciousness found himself standing with his hand in the same position, but torn by the fragments of the shattered tube.††

Gehlen, professor of chemistry at Munich, died July 15th, 1815, a victim to an experiment with arsenetted hydrogen which he accidentally inhaled.* The poisonous nature of this gas was first mentioned by Trommsdorff (J. B.) in 1803, who writes that his health had been "considerably injured by the unavoidable inhalation of this gas, which gives me ample reason to conclude that the gas must be highly poisonous.†

Thénard, professor of chemistry at the Polytechnic School at Paris, came near poisoning himself, in 1825, by means of a solution of corrosive sublimate which he mistook for *eau-sucrée*. The accident occurred during one of his lectures. Having swallowed two mouthfuls of the solution, he replaced the glass with entire self-possession and said: "Gentlemen, I have poisoned myself; what I have taken is corrosive sublimate, and the remedy is white of eggs. Bring me some." The students rushed for the neighboring stores and kitchens, and soon a great pile of eggs was upon the lecture table before the professor. The prompt use of this antidote saved his life, although he was very sick for several weeks after the occurrence.‡

Boullay, a young chemist of great promise, and whose researches on displacement laid the foundation for the process of percolation in the preparation of fluid extracts and tinctures, died in 1835 in consequence of terrible burns received by the ignition of ether, contained in a flask which was accidentally broken while in his hands.§

In 1840, at the School of Pharmacy at Paris, an explosion of an apparatus for the liquefaction of carbonic anhydride resulted in the death of Hervig, assistant in the laboratory.‖

Bunsen met with a severe accident in 1841 while analyzing the cyanide of cacodyl. The combustion tube exploded and injured one of his eyes, and the experimenter himself lay for weeks between life and death, owing to the combined effects of the explosion and the poisonous nature of the vapor.¶

Hennel, chemist at Apothecaries' Hall, London, was instantly killed June 11th, 1842, by an explosion of about six pounds of fulminating mercury which he was in the act of stirring with an ivory spatula.**

Donnet, assistant to Girardin, professor at Rouen, came near losing his sight, in 1843, by the explosion of fulminating silver.

Bescherer, professor at Rudolstadt, died November 29th, 1849, having been poisoned during the preparation of hydrocyanic acid.††

Mansfield, who first obtained benzol from coal-tar, died February 25th, 1855, from burns resulting from the boiling over of a small still containing naphtha, which he was purifying for the purpose of making a series of products for the Paris exhibition.‡‡

Deville, in 1859, while experimenting with osmic acid, was rendered nearly blind for twenty-four hours by accidental exposure to its vapor.§§

In 1863, Stewart, professor at Edinburgh, broke a vessel containing fuming nitric acid. The vapors to which he was exposed produced a difficulty of respiration after a few hours, which resulted in the death of both the professor and his assistant.‖‖

In 1865, two assistants of Dr. Odling, at the laboratory of St. Bartholomew's Hospital, named Ulrich and Sloper, were poisoned by exposure to the vapors of mercuric methide.¶¶

Nickels, professor at Nancy, died in 1869 from breath-

* Poggendorff: *Handwörterbuch*, i., 1410.
† Hœfer: *Hist. de Chem.*, 2d Ed., Vol. ii., 554 Paris, 1869.
‡ *Ann. de Chim.*, v., 211. § Lassus: *Mems. de l'Inst.*, ii., 138.
‖ Hœfer, *Nouv. Biog. Univ.*, Vol. xix.
¶ *Memoirs d'Arcueil*, Vol. iii
** Dr. Paris, *Life of Davy*, pp. 232–233.
†† Gladstone, *Life of Faraday*, p. 10.

* *Schweigger's Journal*, xv., 501.
† *Nicholson's Journal*, Vol. vi
‡ Flourens, *Mem. of Thénard*, trans. in Smithsonian Reports, 1862, p. 303.
§ *Journ. de Chim. et Pharm*, xxi., 382. Buchner, *Rep. der Phar.*, liii.
‖ Girardin, *Chimie Elementaire*. Paris, 1872, Vol. i., 54.
¶ *Nature*. Vol xxiii., p. 597.
** Brandes, *Manual of Chemistry*, 1848. Vol. i., p. 1003.
†† Poggendorff: *Handwörterbuch*, i., 175.
‡‡ *Journ. Chem. Soc.*, viii., p. 111.
§§ *Ann. de Chim. et Phys.* (3), lvi., 400.
‖‖ *Girardin, op. it.*, i., 257.
¶¶ *Chem. News*, xiii., 141.

ing the vapor of hydrofluoric acid, during his experiments in endeavoring to isolate fluorine.*

In 1875, Deville and Debray, while distilling rutheniumtetroxide, met with a violent explosion, by which the labratory was filled with a strong smell of ozone and a dense black smoke, as if turpentine had been burned.†

It may not be uninteresting if I add the names of several distinguished scientists who died by accidents (not chemical) and other untoward causes.

Richman, member of the Academy of Sciences, at St. Petersburg, was killed by a lightning stroke in 1753, during the progress of an experiment, in which he attempted to measure the intensity of the electric fluid in a passing cloud. Lavoisier was guillotined (1794); Smithson-Tennant, who discovered iridium and osmium, fractured his skull by a fall from a drawbridge, at Boulogne-sur-Mer, and died within an hour (1815); Webster, professor of chemistry at Harvard University, was hanged for murder (1850); Hugh Miller, the celebrated geologist, took his own life with a pistol while suffering from cerebral disease (1856); the same year Sharpe, president of the Geological Society of London, was killed by a fall from his horse; and Matthiessen, professor of chemistry at St. Bartholomew's Hospital, London, poisoned himself with prussic acid in a fit of temporary insanity (1870).

Patna Opium.

PATNA is one of the two places in British India where opium is manufactured. The cultivation of the poppy is confined to the large central Gangetic tract, about 600 miles in length and 200 in breadth, which is bounded on the north by Gorakhpur, on the south by Hazāribāgh, on the east by Dināpur, and on the west by Agra. This tract is divided into the two agencies of Behar and Benares, the former being presided over by an agent stationed at Bānkipur, at the latter, by an agent at Ghāzīpur; both agencies are under the control of the Board of Customs, Salt, and Opium, in Calcutta. The Behar Agency is the larger and more important of the two, sending into the market about triple the quantity of the drug turned out at Benares. The poppy cultivation is exclusively the white variety (*Papaver somniferum album*), and the crop requires great attention. The ground having been carefully prepared, the seed is sown broadcast in November, and by February, the plant is generally in full flower, having reached a height of from three to four feet. Towards the middle of that month, the petals are stripped off, and four or five days after their removal, when the capsules have attained their utmost development, the collection of the juice commences, a process which extends from about the 20th of February to the 25th of March. The amount of produce from various lands differs considerably. Under very favorable circumstances of soil and season, the out-turn per acre may be as high as forty-one pounds of standard opium (*i. e.*, containing seventy per cent of pure opium and thirty per cent of the water), paid for at the rate of five shillings per pound; but the average is from twenty-one to twenty-seven pounds per acre. The opium is made up into cakes weighing about four pounds, and containing about three pounds of standard opium. These cakes are packed in chests (forty in each) and sent to Calcutta for exportation to China. The price varies every year; the average for the five years ending 1874 was £133 10*s.* per chest, the cost, as laid down in Calcutta, being £38 10*s.* The variations in price were formerly excessive, but the Government is now careful to regulate the supply according to the demand.

Cinchona Cuprea.‡

DURING the last week of September, 1881, not less than 8,000 seroons of this new bark were imported into London.

* *Chem. News*, xix., 202.
† *Ann. de Chim. et Phys.* (5), iv., 537.
‡ See also page —.

Crystallized Hyoscyamine.

BY H. DUQUESNEL.*

AFTER numerous unsuccessful attempts, the French manufacturers of chemicals have given up the preparation of this alkaloid in a colorless and crystalline state, and it is now made only by foreign (German) manufacturers. But the quality of the product still leaves something to be desired.

If finely and freshly ground hyoscyamus seeds are exhausted by boiling alcohol slightly acidulated with tartaric acid, a tincture is obtained which, when deprived of alcohol by distillation, leaves behind an extract composed of two distinct portions.

The lower, denser and syrupy portion is partly soluble in water, which separates from it an almost solid, resinous matter.

The other, lighter, is composed of a very abundant green oil.

Rejecting this latter, which they even appear to have sometimes attempted to remove by treating the seeds beforehand with certain solvents, most chemists seem to have employed the denser portion for the preparation of the alkaloid. Generally, they could only obtain a syrupy product, often of a pronounced narcotic odor, more or less colored, and consequently of a very variable effect, justifying the discredit which it bears among many physicians, in spite of the physiological researches of which it has been the object.

With this portion of the alcoholic extract of hyoscyamus seed, our results have been about the same, and we could not obtain anything but an amorphous product, not much colored and odorless, it is true, and differing in this from the commercial products; but we could extract from it only with the greatest difficulty a few confusedly crystalline fragments, forming in the midst of a large syrupy mass.

On the other hand, by studying the green extractive oil, which has generally been rejected by chemists, we shall find that it contains a considerable quantity of hyoscyamine (nearly 0.5 per 1,000 of the seeds), that this alkaloid, moreover, easily takes a crystalline shape.

The following is our mode of preparation:

The green oil, well separated by decantation from the syrupy layer, is agitated several times with dilute sulphuric acid, which extracts the alkaloid, the latter being probably combined with a fatty acid.

If the agitation has been performed carefully, the acid liquid separates well and may readily be removed, after which the substance is treated twice more with dilute sulphuric acid. The united acid liquids are nearly completely saturated with bicarbonate of potassium, then filtered, and evaporated on the water-bath. When the residue is in a syrupy condition, it is treated in the cold with strong alcohol, which leaves behind the sulphate of potassium. The alcohol is distilled off and the last portions volatilized on the water-bath. The residue is diluted with water until it has the consistence of very light-colored syrup, then treated with bicarbonate of potassium in slight excess and several times agitated with chloroform which extracts the alcohol. The decanted and filtered chloroform is treated with dilute sulphuric acid in slight excess, the sulphate of hyoscyamine thus formed is decolored by washed animal charcoal, and afterwards evaporated to a syrupy consistence at a very gentle heat.

In order to extract the alkaloid, the use of alkalies must be avoided, as they easily alter hyoscyamine as long as it has not been freed from the accompanying impurities.

For this purpose the sulphate of hyoscyamine is mixed with an excess of precipitated carbonate of calcium, which, by prolonged contact, has the property of setting free an unstable carbonate of the alkaloid and thereby the alkaloid itself.

The mixture is mixed with fine sand in order to better subdivide it, and dried at a very gentle heat, or, better still, under a bell-glass over sulphuric acid or caustic lime.

* *Répert. de Pharm.*, 1881, 510.

When it is dry and finely powdered, it is treated with pure chloroform until the latter ceases to acquire an alkaline reaction. The chloroform is then distilled off, partly at a very gentle heat, the rest evaporated spontaneously, after some rectified toluol had been added, to retard evaporation. In this manner crystals are obtained, which we have the honor to present to the Academy.

Hyoscyamine thus obtained crystallizes in long, colorless, prismatic needles, grouped around a point in form of a star.

It is tolerably soluble in water to which it communicates a strong alkaline reaction, combines with acids, and yields, particularly with sulphuric acid, a neutral, crystalline, and but little deliquescent salt.

It is a powerful mydriatic, acting, under like circumstances, exactly like atropine. Its chemical reactions also seem to have a great resemblance to those of atropine.

Note on the Isolation of Strychnine.

BY ALFRED H. ALLEN.*

CHEMISTS who are in the habit of employing ether and chloroform for the separation of alkaloids and other active principles from aqueous liquids, will have noticed a marked difference in their behavior. In the case of ether, the layer of solvent either separates in a few seconds from the aqueous liquid, or can be induced to do so with absolute certainty by adding more ether, or by thoroughly cooling the liquid. I have never met with an instance in which ether refused to separate very rapidly, provided that it was used in such quantity that the ethereal layer fully equalled in bulk the lower aqueous stratum. The behavior of chloroform exhibits a great contrast with that of ether; frequently many hours, and occasionally days, being requsite for its separation from the aqueous layer, and for the coalescence of the chloroform globules. Even then it not unfrequently has a milky appearance, which is rarely, if ever, noticed in the case of ether. Some operators, by preference, employ chloroform rather than ether, in cases where either liquid is equally suitable, as it is in the isolation of quinine. This preference is probably generally due to the supposed advantage obtained by the greater density of chloroform, which causes its collection below instead of at the surface of the aqueous layer. In certain other cases, however, there is the far stronger reason that chloroform is a greatly superior solvent for the substance to be extracted. Strychnine forms a notable instance of this, being variously stated to require from 340 to 1,800 parts of ether, but only seven to ten parts of chloroform for solution. Nevertheless, and doubtless in consequence of the trouble and delay in the separation of a chloroformic layer, Dr. Tidy and other eminent toxicologists recommend the use of ether instead of chloroform for the isolation of strychnine.

I have myself, till lately, been in the habit of employing ether for the same reason, but now use a solvent, which unites a high solvent power for strychnine with the property of ready separation from the aqueous liquid. This consists of a mixture of equal volumes of chloroform and ether. Such a mixture has a density of about 1.10, and hence is sensibly heavier than most aqueous liquids.

I have, however, recently employed it with solutions so largely loaded with sugar that the solvent mixture floated on the surface; nevertheless, the separation occurred with great facility. In cases where the aqueous liquid approximates very closely in gravity to the solvent, separation can be readily induced by adding water (or better ammonia). Of course, an additional quantity of chloroform or ether may also be added; but if the former be employed in notable excess, the facility of separation is apt to be materialy impaired, whilst if ether be added in considerable quantity, the solvent power of the mixture for strychnine is materially reduced. That this last objection, however, has no great weight, is proved by the following results of experiments made by my pupil, Mr. Charles Harrison, to test the point: One gram of commercial strychnine was dissolved in acidulated water, and the solution diluted to 100 *cc.* Experiment I.—10 *cc.* measure of the above solution (= 0.1 gram strychnine) was treated with excess of ammonia, and the liquid agitated with 10 *cc.* of a mixture of equal bulks of chloroform and ether. On drawing off and evaporating the solvent, exactly 0.1 gram residue was obtained. On again agitating the alkaline liquid with ether-chloroform, an additional weight of 0.004 gram was extracted.

Experiment II.—A repetition of the above gave 0.087 by the first extraction, and an additional 0.019 gram on reagitating, thus making a total of 0.106 gram dissolved.

These experiments sufficiently prove that the solubility of recently-precipitated strychnine in ether-chloroform is amply sufficient to insure its solution in practice. It will be observed that the weights of the total residues obtained somewhat exceeded the original weights of the alkaloid employed. This fact is doubtless due to the strychnine, as dried for a short time at 100° C., retaining some water of combination. I propose to examine this matter fully. It was found that when the solution of the strychnine in ether-chloroform approached dryness, it was exceedingly apt to decrepitate, thus occasioning loss of alkaloid. This tendency was avoided by adding a few drops of alcohol towards the close of evaporation. This precaution is only necessary when perfectly pure strychnine is in solution. The small quantity of impurity usually extracted along with the strychnine when the method is used in toxicological investigations, appears to prevent the tendency to decrepitation. In the extraction of strychnine in such practice, I find it convenient to bring the acidulated aqueous liquid to a volume of about 20 *cc.*, agitate it with ether-chloroform to remove piperine, glucosides, etc., separate, render the liquid strongly alkaline with ammonia, and at once agitate with 30 *cc.* of ether-chloroform. The separation usually occurs very rapidly, but may be induced with certainty by adding water or ether in the manner already described.

* Read before the Society of Public Analysts, March 11th, 1881. From *The Analyst* (London), 1881, 141.

Olive Oil in the Levant.

OLIVE OIL is procured in great quantities throughout the Turkish Islands of the Ægean. Although much is consumed throughout Turkey as an article of diet, very considerable quantities are sent abroad. The island of Candia is the most important oil-producing district, its annual exports amounting to about $850,000, largely supplying the markets of Russia, Egypt, and Greece. In that island the value of the oil ranges from $150–180 per ton (252 gallons), delivered free on board. From Smyrna, about 4,000 to 4,500 tons are shipped every two years, valued at $7.74 to $8.60 per kintal (123½ pounds), mostly to England (the fine), and France (common), say two-thirds to England.

From the coast of Syria the annual exports amount to about $450,000. Last year the crop of Mitylene was an abundant one, the total yield being 180,000 to 200,000 kintals, worth $7.74 per kintal, or about $145 per ton free on board.

Preparation of Pure Phenol.

IN order to prepare pure phenol, W. Alexejeff adds five per cent of water to the commercial substance, and after having melted the mixture, allows it to stand. The crystals which gradually form are drained, and after repeating the operation from two to three times, the product is distilled.

Calvert stated that when four parts of phenol were agitated with one part of water at a temperature below 4°, a hydrate with the composition $2PhHO + H_2O$ (melting point 16°) was formed. The author has been unable to confirm his observations. He finds, however, that when phenol is allowed to stand for several months with an excess of water, crystals are formed which melt at 37°.—*Bull. Soc. Chim.* [2], 35, 379.

Caoutchouc Cultivation in British India.

BY CLEMENT R. MARKHAM, C.B., F.R.S.*

In 1870, I came to the conclusion that it was necessary to do for the india-rubber or caoutchouc-yielding trees what had already been done with such happy results for the cinchona trees. The area of yield of caoutchouc is far more extensive than that of febrifuge bark. While the trees yielding the febrifuge alkaloids only grow wild on the slopes of the Andes, and all belong to one genus, the caoutchouc-yielding trees are of several genera, and are found in the forests of India, the Eastern Archipelago, Africa, Madagascar, Mexico, and Nicaragua, as well as in South America. But the same danger threatens the one product as had threatened the other. Owing to the enormous demand for caoutchouc, the most reckless felling is now going on in all the tropical forests which yield this valuable product. The time has come when plantations must be formed of caoutchouc-yielding trees, in order to prevent their eventual destruction, and to provide for a permanent supply. The increase in the demand for India-rubber is very remarkable, and the enormous number of uses to which this product is now put renders the consideration of measures for its cultivation and for securing the permanency of an adequate supply, a question of great moment. In 1830, only 464 cwt. of India-rubber were imported into England. In 1840, the quantity had increased to 6,640 cwt.; and in 1846, the duty on India-rubber of 1*s.* per cwt. was repealed. In 1857, the quantity had further increased to 22,000 cwt.; and in 1874, there were 129,163 cwt. imported, worth £1,326,605. In 1878, the quantity imported into England was 149,724 cwt., worth £1,313,209. Caoutchouc is now used for an infinite number of purposes. Wherever steam power is employed, either on shore or afloat, it is impossible to do without India-rubber. It is required as packing for the piston rods and glands of the engines, valves for the pumps, washers for making joints, belting for driving the shafting, hose and tubing for conveying steam and water, buffer-springs for railway carriages, and many other such purposes too numerous to mention.

When it is considered that every steam vessel afloat, every railway train, and every factory on shore employing steam-power must of necessity use India-rubber, it is hardly possible to overrate the importance of securing a permanent supply in connection with the industry of the world. For purposes connected with telegraphy this product is also now extensively used. It is employed as the insulating material for submarine, subterranean, and aërial cables. In the hard form of ebonite it is employed for insulators to carry the iron wire along the posts, as well as for battery cells, for the electro-magnetic coils, and in many parts of telegraphic instruments in place of the more expensive article, ivory. India-rubber is also used for waterproof clothing, carriage aprons, fishing stockings, diving dresses, water and air beds and cushions, door mats, ground sheets in camping out, and tubing. India-rubber elastic thread is largely used in the form of webbing, by the Leicester, Derby, and Nottingham manufacturers.

India-rubber is necessary, too, for life-saving apparatus, for surgical instruments and appliances, and for hose, gas-tubing, and innumerable domestic purposes, including door-springs, and, just now, a great many rings for the rinking skates. Ebonite—which is the form of india-rubber vulcanized hard by the addition of extra sulphur, so that it can be turned in a lathe and made into articles of any form or shape—is used very extensively for combs, photographic baths and trays, syringes, tops, and tubing for aquaria, and in chemical works. Such being the infinity of purposes which give rise to the demand, it will easily be understood how bravely the work of destruction is being carried on.

In British India, there is an indigenous caoutchouc-yielding tree, which should be brought under cultivation on the spot. But there are other kinds in other parts of the world, and it became necessary, in the first place, to ascertain whether they are superior to the caoutchouc in British India; for, if so, their introduction would needs be an essential part of any scheme for initiating the cultivation.

The caoutchouc-yielding trees grow in a zone on each side of the equator, encircling the globe, but by far the richest and best source of supply is in South America. It was M. de la Condamine, the leader of an expedition to measure an arc of the meridian near Quito, who first gave an accurate description of caoutchouc, and of the tree from which it is procured. The tree is the *Syphonia* or *Hevea*, which grows in all parts of the basin of the Amazon, and yields the Brazilian caoutchouc. This is the best and most abundant, and is known as Pará India-rubber. The *Hevea* is a euphorbiaceous tree. On the western side of the equatorial region of South America, in Ecuador and Colombia, on the Isthmus of Panama, Central America, and Mexico, the India-rubber tree belongs to the *Castilloa* genus, so named after Don Juan del Castillo, a Spanish botanist, who died in Mexico in 1793. The native name of the tree in Mexico is *ulé*. The *Castilloas* belong to the family of *Artocarpaceæ*, of which the bread-fruit and jack-tree and the *angeli* of India are members.

It is worthy of note that the *Artocarpaceæ* are closely allied to *Moraceæ*, the fig-tribe, to which the caoutchouc of India belong. The *Heveas* and *Castilloas* are the India-rubber trees of the New World. In India, the *Ficus elastica*, a tree so named by Dr. Roxburgh, in 1810, which yields caoutchouc, is found in the forests which border the valley of the Brahmaputra, in the province of Assam. The family of *Apocynaceæ* includes the other caoutchouc-yielding trees of Asia and the eastern islands: the *Chavannesia* of British Burma, the *Urceola* of Borneo, and the *Vahea* of Madagascar, as well as the *Landolphias*, which produce the caoutchouc of Africa.

In commencing caoutchouc cultivation in India, it was in the first place necessary to take stock of all existing knowledge on the subject, and, in the second place, to ascertain whether any of the other kinds were intrinsically superior to the *Ficus elastica*, because, if this proved to be the case, their cultivation would also be desirable. With these objects in view, I intrusted the duty of making the necessary researches and investigations to Mr. J. Collins, formerly curator of the Museum of the Pharmaceutical Society, who drew up a very able and exhaustive report on the subject, in 1872. The conclusions then arrived at were, that the establishment of plantations of *Ficus elastica* should at once be undertaken in Assam; but that the caoutchouc from the *Heveas* and *Castilloas* of South America was superior to that of the *Ficus*, and that consequently those trees should be introduced into British India.

The first step, therefore, was to commence the cultivation of the native Indian caoutchouc tree, which is found in the forests along the northern and eastern boundaries of Assam, as well as in the low valleys of the Naga and Jaintia hills to the south. The *Ficus elastica*, like the banyan and other trees of the same genus, has aërial roots, and is of an epiphyical habit. When wild in the forests, it often commences its growth in the fork of another tree, which it eventually overshadows and destroys. It grows to a great size, and one tree planted at Fezpur, in Assam, thirty-six years ago, is one hundred and twelve feet high. The circumference of the central mass of aërial roots surrounding the stem is seventy feet, and it has over a hundred aërial roots, the largest of which measures six feet in girth.

The forests containing *Ficus elastica* are excessively moist in the rainy season, and they remain moist all through the dry season, with a temperature of 98° in the shade. The trees thrive best under conditions of excessive moisture and great heat, but with good drainage.

Hitherto the caoutchouc has been collected in Assam by men of the wild tribes, who cut every part of the tree

* From the interesting work: *Peruvian Bark. A Popular Account of the Introduction of Cinchona Cultivation into British India.* By Clement R. Markham, C.B., F.R.S. London, 1880. Appendix A.—It may not perhaps be known to all of our readers that Mr. Markham is an advocate for the spelling "chinchona" (instead of cinchona), since the name was given to the bark in honor of the Countess of Chinchon.

they can get at, and allow the milk to flow into holes made in the ground. The collectors are encouraged to obtain the largest possible quantity during the shortest possible time, without any regard to future supplies. This has led to the most outrageous wholesale destruction of these valuable trees, by felling them so as to render the operation of tapping more convenient.

Messrs. Martin & Richie, who had a lease of the caoutchouc yield at Fezpur, are said to have given it up before their time expired, because the supply had diminished so much that their business was no longer remunerative; so that no improvement of the yield can be expected from private enterprise, except at the risk of exhausting the remaining sources of supply; and it is, consequently, necessary to place the collection of caoutchouc in Assam under the control of public officers who have an interest in the protection and improvement of the forests; and to commence the formation of plantations of *Ficus elastica* on a large scale; and in accordance with a well-considered plan, Dr. Brandis, Inspector-General of Forests in India, strongly urged the necessity of these measures in 1872, and good progress has since been made, under the superintendence of Mr. Gustav Mann, the Conservator of Forests in Assam. The first attempts which were started in July, 1873, in the Darjiling Terai, and in the Goalpara district of Assam, were failures; but in July, 1874, Mr. Gustav Mann took charge of the experiment, with very satisfactory results. Three plantations have been formed, one on the right bank of the river Kulsi, in the Kamrup district of Assam, consisting of ninety-five acres in 1879, on which were 2,895 plants. Another is at Charduar, at the foot of the Himalayas, eighteen miles north of Fezpur, in the the Darrang district of Assam, where there were 685 acres under cultivation in 1879, the growth of the trees being excellent and most vigorous. The third plantation is at Bamuni, also near Fezpur. Here there were eight acres planted with 459 trees in 1878; but the climate is too dry. No artificial shade is now given, and the young trees are healthy and vigorous.

Experiments are in course of trial, to plant the *Ficus elastica* in strongly-made baskets, placed in the forks of trees, and on grass lands, as well as in the regularly prepared beds. The trees may be tapped at the age of twenty-five years. After fifty years they will yield 40 lbs. of caoutchouc every third year, worth £3 4*s*. In Cachar, the India-rubber tree was discovered in 1862, and 750 cwt. were collected, the yield being increased to 1,500 cwt. in 1863. The yield from the first tapping is 35–40 lbs. The tree is then untouched for three or four years, and the second tapping yields much less. Mr. Edgar reports the Cachar forests would yield 2,000 cwt. annually. In 1879, the quantity of caoutchouc exported from India was 10,033 cwt., valued at about £61,685. Besides extending the cultivation of the trees, the officers in charge of the plantations will carefully investigate all such questions as the most favorable time of the year for tapping, and the best methods for collecting and preparing the caoutchouc. The experimental cultivation of the *Ficus elastica* has thus been satisfactorily commenced in India, under the able superintendence of Mr. Gustav Mann. Another caoutchouc-yielding plant belonging to the *Apocynaceæ* has recently been discovered in British Burma, and reported upon by Mr. Stettell, of the Forest Department. It is the *Chavannesia esculenta*, a creeper, which it has hitherto been the object of foresters to extirpate, as injuring the growth of the teak trees.

Some of these creepers growing near Rangoon have a girth of eighteen inches round the stem, while the crown covers an area of two hundred square feet, at a supposed age of five years. It may be propagated either from seeds or cuttings, and instructions for its cultivation have recently been published in the *Indian Agriculturist*. The estimated result of cultivating trees 30 feet apart, over an area of 400 acres, or, in all, 19,200 creepers, is that there will be an annual yield of 19,200 viss (a viss is about 3½ lbs.) which at Rs. 200 per 100 viss, will give Rs. 38,400 a year. After the first year, the cost of cultivation will be very slight, and the profits will begin to come in after seven years. As regards the cultivation of indigenous kinds of caoutchouc-yielding trees in British India, it will thus be seen that the initiatory steps have already been taken. The second, and not the least important part of the undertaking, is the introduction of plants yielding a better kind of caoutchouc, from other parts of the world, but especially from South America. The most valuable trees, and those which now yield by far the largest quantity of India-rubber, are the *Heveas* of the Amazon valley, called Para, from the port of shipment. We learn from Keller that during the last few years both the quantity and the value of India-rubber exported from Pará have been steadily increasing. In 1874, England received 56,580 cwt. of Brazilian caoutchouc, worth £720,000, the average price being 2*s*. 6*d*. to 3*s*. a lb. Next to the Pará rubber in value and yield, comes that obtained from the *Castilloa* trees, which grow over a much wider area of South and Central America. The quantity of *ulé* or *Castilloa* caoutchouc imported into England in 1874 was 24,286 cwts., worth £287,413 at 2*s*. a lb. Thus out of the whole import of 129,263 cwts., 70,866 come from South America. The remaining 38,775 cwts. are divided among British India, Borneo (1*s*. 9*d*. a lb.), Africa (1*s*. 5*d*. a lb.), and Madagascar (2*s*. 3*d*. a lb.); but the South American source of supply is, beyond comparison, the most valuable, and the cultivation of *Castilloa* and *Hevea* trees in India is an important part of the undertaking.

Several reasons led me to the decision that a collection of the *Castilloa* seeds should first be obtained. As the *Castilloas* grow over a much more extensive area than the *Heveas*, where there is a greater variety of soil and climate, it is now certain that suitable sites for their cultivation would be found in India and Burma. They belong to the *Artocarpaceæ* which are so well represented in India, especially on the Malabar and Travancor coasts, by the jack trees and the anjeli, of which wood all the canoes are built. The *Castilloa* trees flourish in all the equatorial forests on the west coast of South America, and in 1878 the quantity of India-rubber exported from Guayaquil was 6,561 cwts., worth £22,963. The trees also abound all over the Isthmus of Darien, where they are being destroyed most recklessly, in Central America and in the southern states of Mexico. In Ecuador the India-rubber is called *heve;* in Mexico and Central America the Aztec word *ulé* is used. The trees, which are the giants of equatorial American forests, belong to two species, the *Castilloa elastica*, and that which Mr. Collins has named *Castilloa Markhamiana*.

They thrive in dense steaming and warm forests, and are particularly abundant in the Valley of the San Juan de Nicaragua, where it rains for nine months in the year. In Nicaragua the yield is said to be about 10,000 cwt. giving employment to 600 *huleros* or collectors. From Carthagena, Guayaquil, Panama and Vera Cruz are exported supplies of *ulé* India-rubber, the greater part of which goes to the United States, but it has been seen that as many as 25,286 cwt. arrive in England.

The collection of *Castilloa* plants for introduction into India was a very difficult service, for the trees grew in wild and unhealthy forests, with no means of transit, and no facilities of any kind. In Mr. Cross, I found a man with all the requisite qualifications for undertaking it. He is an excellent gardener, possessed of great energy and determination, combined with judgment; is acquainted with the language, and has had much experience in South American travelling. No better man could be found to execute the difficult task of obtaining a supply of *Castilloa* plants, and conveying them in a healthy state from their native forests to the gardens at Kew.

Mr. Robert Cross left England on the 2d of May, 1875, and reached Panama on the 26th of the same month, my instructions to him being to endeavor to make the collection on the isthmus.

He found that great destruction was going on among the *ulé* tree in all parts of the Darien isthmus, the native collectors cutting down the trees in order to tap them more

easily, as in the Assam forests. After obtaining all the information that could be procured in Panama, Mr. Cross determined to select the forests on the banks of one of the largest tributaries of the river Chagres as the base of his operations. He ascended the Chagres River in a canoe, and then made a journey on foot through the dense forest, into the heart of the *ulé* district. He found the *Castilloa* saplings growing on the banks of streams, with their roots often running down to the edge of the water. They abound in rich soil along the base of the hills, and are also met with on the summits of ridges; everywhere except in swampy ground. The trees, which proved to be of the species named by Mr. Collins *Castilloa Markhamiana*, are from 160 to 180 feet high, with a diameter of five feet, and a yield of 100 pounds of India-rubber. The wood is spongy and soft, and decays rapidly when bruised or injured. Many of the leaves measure fourteen inches in length and seven inches in breadth. The temperature of the forests ranges from 75° to 80° Fahr., and they are excessively damp. The range of the *Castilloas* is so wide that, in some places, the trees must flourish in climates which, at one time of the year, are dry. It is probable, however, that the species with the best and largest yield of caoutchouc flourish best in a hot and very damp and steaming atmosphere, like that of the forests of the Isthmus. Mr. Cross collected 600 plants, and also drew a quantity of milk, in order to prepare a specimen of the rubber. The sample he brought home was examined and reported upon, and was pronounced to have much less impurity than is usual for this kind of rubber, and thus proved Mr. Cross' plants to be of the best species. He left the Isthmus with the plants on the 6th of September, 1875, on board the mail steamer Shannon, but, in the morning of the 8th, when going thirteen knots an hour, the vessel ran on the Pedro reef of rocks, off the coast of Jamaica, and her bows were immovably fixed upon them, while the stern continued to bump heavily for many hours. The rest of the passengers left the ship in boats, but Mr. Cross stuck manfully to his plants, and was eventually taken on board H. M. S. Dryad. He came home in the mail steamer Nile, reaching Southampton on the 2d of October. Considering all the extraordinary difficulties of the undertaking, it reflects great credit on Mr. Cross that he should have been successful, and thus have performed an important public service with ability and sound judgment.

There were soon 134 of Mr. Cross' *Castilloa* plants in a flourishing condition, at Kew gardens, and in the course of 1878, a good supply of *Castilloas* was forwarded to India to form the nucleus of a series of plantations.

Thus the introduction of one out of the two valuable South American species was provided for. It remains to take measures for obtaining plants of the most valuable kind of all from the Valley of the Amazon, the *Hevea*, yielding the famous Pará India-rubber of commerce.

The *Heveas* are of several species, and, like the *Castilloas*, they are large trees, growing in humid tropical forests. Dr. Spence, who is the highest authority on this genus, considers that the Cordilleras of the Andes separate the *Castilloas* from the *Heveas*, and that the caoutchouc-yielding trees to the eastward of the Andes are of the latter genus. They extend up to the very foot of the mountains, and I have myself passed some time among *heveros*, collecting for local use in the *Montañas* of Paucartampu and Laris. While in Peru and Ecuador the India-rubber is called *heve;* in Brazil, the name is *seringa*, and the collectors are *seringueiros*. Eight species are enumerated by Collins.

Hevea Brasiliensis is the species which prevails round Pará and the forests of the lower Amazon; *H. Spruceana* is met with round the mouth of the Tapajos, and the other species occur on the banks of the Rio Negro and Casiquiari, but the genus is far from having yet been thoroughly studied.

In the Pará districts of the lower Amazon, very little rain falls from August to February; the heaviest rains begin in May and June, and the temperature varies between 74° and 95° Fahr., the mean of a year being 81°. The Amazon valley is remarkable for uniformity of temperature, and for regular supply of moisture, the dry season extending from June to December, and the wet from January to May. In the upper Amazon, the atmosphere is densely vaporous. Our latest authorities on the Pará caoutchouc are Mr. Wickham and Mr. Franz Keller. The latter traveller, writing in 1874, says that the *Hevea* trees on the shores of the Amazon have nearly disappeared, owing to the destruction and death of trees, the places of which have never been filled up.

Resorcin; its Therapeutic Effect.

ACCORDING to Dujardin-Beaumetz and Cullias, resorcin has the following chemical and physiological properties:

1. It shares with salicylic acid, carbolic acid, and other substances belonging to the aromatic series, the property of being an antiferment (in the proportion of 1 : 100), and an antiseptic (1.5 : 100).

2. Resorcin has a toxic power inferior to that of carbolic acid, which may be fixed in the following manner:

a. If taken in quantities of 30 to 60 centigrams (5–10 grains) for each kilogram (2½ lb.) of body-weight, it produces trembling and tonic convulsions, and accelerates respiration and circulation, all of which symptoms disappear in one hour. Sensibility and consciousness are unimpaired.

b. The quantity of 60 *cgm.* (10 grs.) for each kilogram, causes intense vertigo and loss of consciousness; the sensibility is blunted; the clonic convulsions are violent and frequent, and affect the anterior middle of the body of the animal. The pupils are dilated, and the respiration and circulation are excessively accelerated. The temperature is but little affected. All these symptoms disappear in from one to two hours.

c. In quantity of 90 *cgm.* to 1 gram (14.5–15 grs.) for each kilogram, death supervenes in about thirty minutes, preceded by similar symptoms, which are, however, not so violent in the limbs. There appear tetanic contractions of the muscles of the neck. The temperature rises gradually, and, without exception, up to 41° C. (105.8° F.) at the moment of death. There is no tetanus. Rigor mortis sets in about fifteen minutes after death. This shows that resorcin is an excitant of the central nervous system.

3. Resorcin has no influence upon the morphological state of the blood, except when it is brought in direct and actual contact with the liquid blood.

4. Resorcin is a remedy which may be used externally and internally in all diseases due to contagious germs, or in diseases which favor their development and in which other benzol-derivatives have been used.

The antirheumatic, febrifuge, and antipyretic power of resorcin is not yet well defined, and requires further study.

5. The authors express the wish that resorcin, owing to its extreme solubility, its almost total freedom from odor, its lesser toxic power, and its want of causticity may be experimented with in surgical cases in the same manner as carbolic acid is used.—*Rép. de Pharm.*, 1881, 526.

Sulphate of Strychnine.

COMMERCIAL strychnine sulphate, $C_{21}H_{22}N_2O_2.H_2SO_4 + 2H_2O$, crystallizes in needles. The water is expelled at 150°. To prepare the neutral sulphate $(C_{21}H_{22}N_2O_2)_2.H_2SO_4$, a solution of the acid sulphate is divided into two equal portions, one-half is precipitated by ammonia, and the precipitate is added to the other part of the solution and the mixture boiled. On cooling, the liquid deposits the neutral salt in transparent prisms, containing 5 mols. H_2O. The crystals become anhydrous at 200°. By the spontaneous evaporation of an aqueous solution of this salt, transparent pyramids belonging to the quadratic system are obtained. These crystals contain 6 mols. H_2O.—C. RAMMELSBERG, in *Ber. d. Deutsch. Chem. Ges.*, 1881, 1231.

Picrotoxin.

In 1880, Barth and Kretschy stated that the commercial picrotoxin was a mixture of three proximate principles, named, by them, anamirtin, picrotin, and picrotoxin proper. Subsequently, E. Paternò (in *Gaz. chim. Ital.*, 11, 36) contended that *picrotoxin* was a definite, homogeneous substance, which, however, splits up easily into *picrotoxinin* and *picrotin*.

E. Schmidt (*Ber. d. Deutsch. Chem. Ges.*, 1881, 817) confirms Paternò's statements. Accordingly, picrotoxinin and picrotin are decomposition products obtained from picrotoxin by protracted boiling with considerable quantities of benzol. This decomposition, however, occurs not only by boiling with benzol, but also under the influence of other agents, and may possibly take place during the preparation of picrotoxin itself. It is, hence, not improbable that commercial picrotoxin contains more or less of these decomposition products. According to E. Schmidt, this splitting up takes place according to the following equation:

$$\begin{array}{rcl} C_{30}H_{40}O_{16} & = & C_{15}H_{16}O_6 + C_{21}H_{24}O_{10}. \\ \text{Picrotoxin} & = & \text{Picrotoxinin} + \text{Picrotin}. \end{array}$$

Besides picrotoxin, *Cocculus indicus* contains another alkaloid, which is not bitter, and which has been called *cocculin* ($C_{19}H_{20}O_{10}$) provisionally.

Cinchonamine; a new Cinchona Alkaloid obtained from Cinchona "Cuprea."

BY M. ARNAUD.*

The first alkaloids isolated from cinchona barks in a state of purity were cinchonine and quinine, by Pelletier and Caventou, in 1820. Other chemists later on discovered two new alkaloids: quinidine, which is isomeric with quinine, and cinchonidine, isomeric with cinchonine. These alkaloids, the existence of which was at one time denied, then again admitted, were thoroughly studied by Pasteur. Pelletier and Carriol had announced the existence, in certain barks, of an alkaloid which they named aricine. Hesse, in some late researches, confirmed the existence of this body and also the composition assigned to it. In 1872, Hesse discovered quinamine, and an isomer of it, conquinamine, in certain cultivated East Indian barks. Finally, Willm and Caventou obtained, by oxidizing cinchonine with permanganate of potassium, a new body: hydrocinchonine, which differs from cinchonine only by having two atoms of hydrogen more. This is also the composition of the new alkaloid, of which I have presented a report to the Academy of Sciences. The new base differs completely, in its chemical and physical properties, from hydrocinchonine. I propose to call it *cinchonamine* in allusion to its relationship with cinchonine and quinamine.

I ascertained the presence of cinchonamine in a very dense bark, of a deep red-brown, with resinous fracture, coming from the province of Santander (United States of Colombia).† This bark does not resemble that usually exported from those regions. Cinchonamine exists in this bark simultaneously with cinchonine, a fact which I affirm. The proportion of these alkaloids is 0.8–1.0 per cent of cinchonine and 0.2 per cent of cinchonamine. In order to extract them, the bark is treated with milk of lime; the mixture, dried at the ordinary temperature, is exhausted by strong boiling alcohol; the latter is distilled off, and the residue taken up by an excess of dilute hydrochloric acid. The hydrochlorate of cinchonamine, but little soluble in the cold, crystallizes, while the hydrochlorate of cinchonine remains in solution. Upon this fact is based the method of separation.

Cinchonamine is insoluble in cold water. It crystallizes from the boiling, alcoholic solution in colorless brilliant and anhydrous prisms; from the warm ethereal solution, or on spontaneous evaporation, it crystallizes in fine needles. One part of the alkaloid is soluble in 100 parts of ether, sp. gr. 0.720 at 17° C., and in 31.6 parts of alcohol of 90%. It melts below 195° C., and on cooling, becomes a transparent amorphous mass. Its alcoholic solution has an alkaline reaction. It is dextrogyre, the angle of rotation

* *Répert. de Pharm.*, 1881, 507.
† On Cuprea bark, see New Rem. 1881, 332.

Fig. 1.

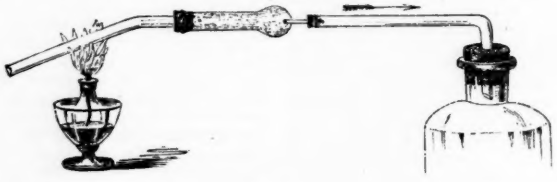
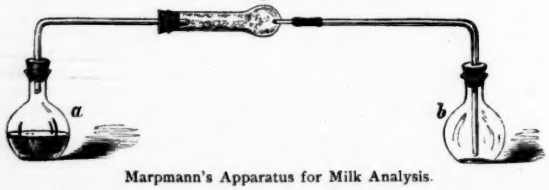


Fig. 2.



Marpmann's Apparatus for Milk Analysis.

Milk Analysis.

G. Marpmann proposes to estimate the amount of water and fat in milk in the following compendious manner.

An ordinary chloride of calcium tube is charged—not too firmly—with cotton, weighed,* and about twenty or thirty drops of the milk to be assayed are then added, so that the whole of it is soaked up by the cotton. The latter is then pushed in a little further with a knitting needle, and the whole weighed again. A tube of hard glass is now attached to one end, and while this is heated in a flame, air is drawn through the apparatus by means of an aspirator. In this manner the milk in the cotton will be deprived of water in ten to fifteen minutes. The fat may be extracted by means of benzin, and this is done very easily by using the contrivance shown in the second cut.

A small flask *a* is about one-fourth filled with benzin, and, after the chloride of calcium tube and flask *b* has been connected with it, it (the flask *a*) is set into hot water. Benzin will then distil over into *b*, and by now immersing *a* into cold water, the benzin will flow back into *a*, taking with it the fat of the milk. This is repeated three or four times, when the fat will all have been extracted, after which the tube is dried at 110° and weighed. The whole operation lasts about three-quarters of an hour.—*Arch. d. Pharm.*, 1881, 16, 34–36; *Rep. d. Anal. Chem.*, 1881, 248.

* It will be necessary to insure the total absence of moisture and fat in the cotton, which is best secured by using purified (absorbent cotton) and by passing a current of hot air through it, before weighing and introducing the milk.—Ed. N. R.

for the solution in alcohol of 93% is $[\alpha]_D = + 117.9°$. The solutions of its salts are precipitated by potassa and ammonia. It completely neutralizes acids, forming salts which are generally but little soluble. Its taste is slightly bitter. The salts, in acid solution, are not fluorescent.

The chlorhydrate, $C_{19}H_{24}N_2O.HCl.H_2O$ crystallizes very easily in prisms or prismatic plates, but little soluble in cold water, much more so in water acidulated with hydrochloric acid.

The chloroplatinate, $(C_{19}H_{24}N_2O.HCl)_2PtCl_4$, is a bright-yellow, crystalline powder, obtained by precipitating a salt of cinchonamine in acid solution, by an excess of platinic chloride. The precipitate is nearly insoluble in pure and in acidulated water.

The sulphate, dried at 100° C., $(C_{19}H_{24}N_2O)_2.H_2SO_4$, very soluble in water, crystallizes well from alcohol. By spontaneous evaporation of the alcoholic solution it is deposited in the form of an amorphous resin.

The nitrate, a crystalline precipitate, is nearly insoluble in dilute nitric acid.

The hydriodate and the acetate are very little soluble in cold water; they are likewise crystalline.

The sulphate is dextrogyre in acid solution, but the rotatory power of the alkaloid is greatly diminished, the angle of rotation being only $[\alpha]_D = + 45.5°$ at 16° C.

The results of the analysis of cinchonamine and its salts agree well with the formula $C_{19}H_{24}N_2O$, as well as with $C_{20}H_{24}N_2O$. If the former formula be adopted (according to Skraup) for cinchonine, the same formula must be adopted for the new alkaloid, since the two are distinguished only by two atoms of hydrogen. On the other hand, cinchonamine has two atoms of oxygen less then quinamine. The following are the analytical data:

	Found (mean).	Calculated for $C_{19}H_{24}N_2O$.
Carbon	77.20	77.02
Hydrogen	8.41	8.10
Nitrogen	9.30	9.46
Oxygen	....	....

For the chloroplatinate $(C_{19}H_{24}N_2O.HCl)_2PtCl_4$ there were:

	Found.	Required.
Platinum	19.45	19.70
Chlorine	20.75	21.20

The most Convenient Form of Metallic Zinc for Use in the Laboratory.

PURE metallic zinc appears in commerce frequently in such form that it is not well suited for every purpose, and it is often difficult to comminute it or it can only be broken up with the risk of introducing other metallic impurities.

The best form is that which offers the largest possible surface, and which leaves the metal so brittle that it may readily be broken up by the hand. This is accomplished, according to C. Mann, as follows:

The zinc is melted at a low temperature in a porcelain crucible over the gas flame, or, if a muffle is at hand, and larger quantities are to be operated on, melt it in an earthen pot. In the latter case, a little borax should first be melted in the vessel, and the whole of the interior glazed therewith before the metal is introduced. When this is melted, it is poured in a small stream upon a strong, polished plate of porcelain or stone, which is inclined under an angle of twenty-five to thirty degrees. While that portion of the melted zinc which comes immediately in contact with the cool plate, becomes chilled and solidifies, the rest of the melted metal flows off, and in this manner a ribbon is produced, which may be obtained of a thickness of 0.2 to 0.5 millimeter, and of a length up to about 0.5 meter (18 inches).

These thin ribbons, or strips, are perfectly free from oxide, have a crystalline structure, and are, therefore, very brittle, so that they may easily be broken into very small fragments. Zinc in this form is highly useful for laboratory uses.—*Zeitsch. f. anal. Chem.*, 20, 518.

Improvement in the Mode of Using Hydrosulphuric Acid.

G. S. DE CAPANEMA communicates the description of a contrivance devised by him to effectually saturate a solution with hydrosulphuric acid without the annoyance of the bad odor of the excess of gas. He uses a bottle, *a*, or a flask, to which is fitted a doubly-perforated stopper, provided with a pipette *b* with large pear-shaped bulb, and a bent tube *c*, communicating with a hydrosulphuric acid generator. The liquid to be saturated or to precipitated is introduced in the flask, and the pipette at first drawn up, until the lower end of its tube is above the liquid. Hydrosulphuric acid is now passed until the atmospheric air in the flask and pipette is displaced, and the pipette then pushed down until the lower end of its tube nearly touches the bottom of the flask. The pressure of the gas will force some of the liquid into the pipette. By cautious swinging of the apparatus new portions of the liquid are successively brought in contact with the gas, and, in consequence of its absorption, the liquid in the pipette descends, sometimes with great rapidity. The saturation or precipitation is completed, whenever the liquid no longer descends from the pipette. The current of gas is then shut off, the whole briskly agitated, the pipette drawn up, and, when all the liquid has run out, carefully washed

Capanema's Apparatus for using Hydrosulphuric Acid.

with distilled water to free it from any particles of the precipitate which may adhere to it.

If it is desired to prevent the escape of odor entirely, the upper end of the pipette may be provided with an additional tube, charged with a loose pellet of cotton and a quantity of cut filter-paper saturated with solution of acetate of lead.—*Zeitschr. f. Anal. Chem.*, 1881, 519.

New Form of Administering Tannic Acid.

As a practical result of his investigations on the efficacy of tannic acid, Dr. L. Levin recommends a new form for its administration. It has been proved by experience that a solution of tannic acid, and still more the substance itself in powder, not seldom fail to produce the desired effect, or that they produce collateral effects which are not sought for or objectionable, such as loss of appetite, coated tongue, feeling of weight in the epigastrium, etc.

These untoward effects may be avoided by giving the substance in form of tannate of albumin (or tannin-albuminate). On adding to a 1 or 2 per cent solution of tannin a filtered solution of the white of one egg in 100 cc. of water, and shaking the mixture, there results an opalescent, slightly milky fluid, which has a much fainter astringent taste than the corresponding pure solution of tannin. The author states that even in the case of infants of only a few weeks of age, the above mixture, suitably diluted, has produced very good results.—*Pharm. Post*, 1881, 427.

Selections from the Non-officinal Formulary* of the Dutch Society for the Advancement of Pharmacy.

Acetum Aromaticum. Parts.

Oil of rosemary	1
" juniper	1
" lemon	1
" thyme	2
" cloves	5
Tincture of cinnamon	100
Aromatic tincture	50
Dilute acetic acid	1,000
Distilled water	200

Mix and filter.

Acidum Chinovicum. Cinchona-bitter.

This is obtained as a by-product in quinine factories. It appears as a white or light-yellow, very bitter powder, which is a mixture of chinovic acid and of a glucoside thereof, chinovin.

It is soluble in ammonia and in lime-water to clear solutions, from which it is thrown down by acetic or hydrochloric acid. It is also soluble in strong, boiling alcohol, and on cooling, forms in microscopic crystals. Chinovin may be separated from it by a mixture of equal parts of strong alcohol and water.

Acidum Chrysophanicum. Chrysarobin.

Chrysophanic acid crystallizes in golden-yellow needles, of a metallic lustre, and grouped in star-form, which melt at 162° C., are little soluble in cold, more so in boiling water, quite soluble in strong alcohol, ether, and benzol. Nitric acid colors it red, sulphuric acid dissolves it with a red color.

On strongly heating chrysophanic acid, a flocculent, yellow sublimate is produced and a carbonaceous mass remains behind.

The alcoholic solution of the acid yields, with an alcoholic solution of acetate of lead, a white precipitate, which partially disappears on boiling, while carmine-red flakes, insoluble in water, remain behind.

Acidum Metatartaricum. Metatartaric acid.

Heat powdered tartaric acid in a porcelain capsule, on a sand-bath, to 180° C., pour the molten mass, by means of a heated glass-rod, in drops, upon a plate of glass, and transfer the cooled pieces at once into well-closed bottles.

Transparent, yellowish pieces, of an agreeable sour taste and very hygroscopic.

When dissolved in water, it gradually reverts back to tartaric acid, especially on warming.

Æther Cantharidatus. Blistering Ether.

Cantharides	2
Ether	q. s.

Pack the cantharides in a percolator, pour ether on top, until they are penetrated, and set aside, well-covered, for 24 hours. Then gradually pour ether on top, until 3 parts of product are obtained.

Ferri Albuminas. Albuminate of Iron.

Dry white of egg (about equal to 40 parts of ordinary white of egg.)	10
Solution of chloride of iron (sp. gr. 1.480)	24
Distilled water	9.2

Dissolve the white of egg in 1,000 parts of distilled water, let the solution stand 12 hours and filter. Then add to it the solution of chloride of iron diluted with 240 parts of water. Shake the mixture thoroughly and evaporate it to a syrupy consistence at a temperature not exceeding 40° C. Spread the syrupy liquid on plates of glass, and expose them to a temperature not exceeding 40° C.

The product is in form of transparent, golden-yellow scales, containing 3.34% of iron, and easily soluble in warm water, after the addition of a little hydrochloric acid.

Alcoholaturæ. "Fresh" Tinctures.

Juice of fresh plants (obtained by kneading and pressing, without the addition of water)	1
Strong alcohol	1

Mix, shake frequently during 24 hours, then filter.

Solutio Acidi Arsenici. Solution of Arsenic Acid.

Arsenious acid	4
Hydrochloric acid	1
Nitric acid	9
Distilled water	q.s.

Boil the acids together, in a glass-flask, until a small sample of the liquid, neutralized with potassa, is no longer colored green by addition of solution of bichromate of potassium. Then evaporate the liquid in a porcelain capsule on the water-bath, until acid vapors are no longer given off, and the liquid has acquired a syrupy consistence. Finally add distilled water to make the product weigh 80 parts.

Contains 5.75% of arsenic acid.

Antimonii Arsenias. Arsenate of Antimony.

Tartrate of antimony and potassium	1
Boiling distilled water	8
Solution of arsenic acid	q. s. (about 35)

Dissolve the tartrate in the boiling distilled water, and add solution of arsenic acid until no more precipitate is produced. Heat the mixture to 100° C., then collect the precipitate on a filter, wash it with distilled water, until the washings, when supersaturated with ammonia, are no longer rendered cloudy by magnesium-mixture, and dry the product between 30° and 40° C.

A white, amorphous powder, easily soluble in hydrochloric acid, less so in dilute nitric or sulphuric acid, nearly insoluble in water or alcohol.

Quiniæ Arsenias. Arsenate of Quinine.

Solution of arsenic acid	87
Boiling distilled water	65
Quinine	17

Boil the mixture until everything is dissolved, filter, if necessary, and pour the liquid into a flat capsule. When cool, collect the crystals and dry them between blotting-paper.

White, shining needles, easily soluble in dilute acids, in 130 p. of cold, 10 p. of boiling water, 188 p. of strong alcohol, and insoluble in ether. The salt contains 14.55 per cent of arsenious acid, or 9.49% of arsenic.

Quiniæ Bisulphas. Bisulphate of Quinine.

Sulphate of quinine (di quinine sulphate, the officinal salt)	3
Dilute sulphuric acid (sp. gr. 1.113–1.117)	2
Distilled water	12

Dissolve the sulphate of quinine in the dilute acid mixed with the water, and evaporate the liquid, at a temperature of 30°–40° C. to about one-half. Allow it to crystallize, collect the crystals in a funnel, let them drain and dry them between blotting paper. From the mother-liquid another crop of crystals may be obtained in the same manner. And from the last mother-water the quinine may be thrown down by carbonate of sodium.

Colorless, columnar crystals, efflorescent on exposure to air, soluble in alcohol and in 11 parts of water.

Quinetum. Kinetum. Chinetum.

(The mixed alkaloids of red bark.)

Red cinchona bark (the bark of the trunk of Cinchona succirubra, grown in Java or India, and containing at least 6 per cent of alkaloids), in fine powder	1,000
Normal hydrochloric acid (volumetric standard)	1,000
Oxalic acid	12
Solution of soda	q. s.
Water	q. s.

* Formularium: bevattende Voorschriften van geneesmiddelen niet in de Pharmacopœa neerlandica, editio altera, voorkomende. Uitgegeven door het Department "Rotterdam," der Nederlandsch. Maatschappij "ter bevordering der Pharmacie." Zevende Druk. 8vo, s'Gravenhage, 1881.

Formulary: containing receipts of medicaments not occurring in the Netherlands Pharmacopœia, 2d edition. Edited by the Rotterdam Section of the Netherlands Society for the Advancement of Pharmacy. Seventh edition, 8vo. The Hague, 1881.

A few titles have been slightly altered to make them more adapted to our nomenclature.

Macerate the cinchona with the hydrochloric acid and 3,000 parts of water for at least 12 hours, occasionally stirring. Pour the mixture into a percolator, the lower orifice of which is closed by a linen plug, and, as soon as the liquid runs off clear, displace with water until the liquid running from the percolator is no longer precipitated (though it may be colored) by solution of soda.

To the strained liquid (which may amount to perhaps 8,000 parts) add the oxalic acid dissolved in a little water, and then add *carefully*, under continued stirring, just enough solution of soda, until the precipitate which forms at first, separates in coherent flakes. Separate this precipitate (which consists of oxalate of calcium and cinchona-red) by pouring off as much of the still acid, clear liquid as is possible and filter the remainder. To the united liquids add now an excess of solution of soda, let it settle, and collect the precipitate upon a moistened double filter. Wash it with a weak soda solution until the washings have only a light-red color, then wash with the least possible quantity of water, until the washings begin to have a bitter taste. Let the precipitate drain, dry it in the air and powder it.

Quinetum is completely soluble in strong warm alcohol. When 3.1 gm. of quinetum are dissolved in 10 cc of normal hydrochloric acid, this solution must be clear, and, on the addition of 2 gm of Rochelle salt, must yield a precipitate, which, when dried, should amount to *at least* 65 per cent of the weight of the quinetum dissolved.

Quineti Boras. Borate of Quinetum, Soluble Quinetum.

Quinetum	1
Boric acid	2
Distilled water	10

Dissolve the acid in the water, by heat, and add the quinetum gradually to the solution. Filter, if necessary, evaporate to dryness, on a water-bath, and reduce the mass to powder.

A very pale-yellow powder, completely soluble in water, and of an alkaline reaction.

Chinoidini Boras. Borate of Chinoidine, Borate of Quinoidine

Commercial chinoidine	2
Boric acid	1
Distilled water	20

Dissolve the acid in the water by heat in a covered enamelled vessel; then add the chinoidine and boil until it has become liquid and is partly dissolved. Then allow the mixture to remain quiet a few minutes and pour the still warm, clear liquid through a funnel the neck of which is closed with a small pellet of cotton. Boil the clear filtrate for a few minutes in the covered vessel, and again pour through the funnel in order to remove the brownish-black, apparently resinous matter. Repeat this boiling of the filtrate, and, if anything more is separated, repeat it once more. Then evaporate the last filtrate (which may be cloudy, but will, when cold, become clear without separating anything) until its weight is equal to that of the chinoidine used, and set it aside for one night, at a temperature of not over 15° C. Separate the liquid, by pouring through a funnel stopped with cotton, from the separated boric acid, —the quantity of which is dependent on the purity of the chinoidine used—evaporate it to dryness on a water-bath, and rub the residue to powder.

A yellow powder, forming a yellow, alkaline solution with 3 parts of water. A solution of 1 part of the powder in 10 parts of water, when heated to boiling, should become quite cloudy, but recover its transparency on cooling. This solution should not be rendered cloudy by the addition of a few drops of solution of hyposulphite of sodium. The compound should contain at least 54% of chinoidine, and should have a right-handed rotation, varying, according to the chinoidine used, from $[\alpha]_D = +10°$ to $[\alpha]_D = +25°$.

Chinoidinum Purificatum. Purified Chinoidine (or Quinoidine).

Chinoidine, commercial	1
Benzol	3

Digest the chinoidine while agitating or stirring with 2 parts of the benzol, on the water-bath. Pour off the clear solution, and wash the residue with the remainder of the benzol. Shake the united clear liquids with a small excess of dilute hydrochloric acid, remove the acid liquid, after settling, by a separating funnel, and render it faintly alkaline by solution of soda. Examine a small sample for its purity, by adding to the clear, diluted solution a few drops of concentrated solution of hyposulphite of sodium, whereby a precipitate must not be produced which does not disappear on further dilution with water. If this is the case, then the whole liquid must be purified by adding the hyposulphite until no longer a permanent precipitate is produced. Then warm the liquid on the water-bath, mix it with an excess of soda, wash the precipitate with water, and dry it on the water-bath.

Chinoidine thus purified appears, in thin layers, as a dark yellowish-brown, transparent mass, completely soluble in benzol, alcohol and acids. Ether should dissolve at least 70 per cent of it. The saturated compounds with acids have an alkaline reaction, and must be soluble in water, in all proportions. Salts of impure chinoidine yield clear solutions only with *a little* water; on the addition of more water they are rendered turbid.

Calcii Chinovas. Chinovate (Kinovate) of Calcium.

Chinovic acid	q. s.
Lime (freshly prepared)	1
Distilled water	120

Mix 4 parts of the acid with the lime and a little water to a uniform mixture, and add to it afterwards the rest of the water. Filter and mix the clear solution, by triturating in a mortar, with a little chinovic acid, so that a small quantity of it remains undissolved. Filter, evaporate on the water-bath to dryness, and powder the residue.

The salt is completely soluble in 30 parts of water. It is less soluble in warm water; the cold saturated solution, when warmed, becomes thick like starch-paste.

Chinoidini Chinovas. Chinovate (Kinovate) of Chinoidine (Quinoidine).

Chinovic acid	5
Magnesia	1
Distilled water	50
Purified chinoidine	q. s.

Mix the chinovic acid and magnesia accurately with the distilled water, filter and add to the filtrate a solution of purified quinoidine in dilute sulphuric acid as long as a precipitate is produced. Collect this on a filter, wash it, and dry it at a gentle heat.

A grayish-white powder, insoluble in water.

Chlorodyne.

	Parts.
Morphine hydrochlorate	1
Extract of Cannabis indica	1
Oil of peppermint	0.2
Oil of cherry-laurel	0.1
Dilute hydrochloric acid	2
Tincture of capsicum (1 : 10)	4
Stronger alcohol	8
Spirit of chloric ether	8
Chloroform	48
Syrup	48

Mix the extract of cannabis with the alcohol and tincture of capsicum, and put the mixture, together with the spirit of chloric ether and chloroform, in a flask. Then dissolve the morphine salt in a little water and add this to the syrup. Shake it well and then add to it the acid and the oils. Keep the mixture in a well-closed bottle, protected from the light, and shake well before using.

(Spirit of chloric ether is prepared by pouring a mixture of 6 parts of sulphuric acid and 24 parts of stronger alcohol, upon 8 parts of chloride of sodium and 3 parts of manganic oxide, in a flask, distilling off 22 parts, shakin this with soda solution, and rectifying, so that 21 parts product are obtained.)

Magnesii Citras Effervescens. Effervescing Citrate of Magnesium.

Carbonate of magnesium	25
Bicarbonate of sodium	91
Citric acid, in fine powder	117
Sugar, in fine powder	21
Distilled water	1
Stronger alcohol	q. s.

Rub the carbonate of magnesium and 75 parts of the citric acid with the distilled water and dry the mixture at 50° to 60° C., until it is converted into a dry powder. Then add to it the bicarbonate of sodium, sugar, and the rest (42 parts) of the citric acid previously mixed together. Dampen the mass with stronger alcohol, and pass the damp powder through a sieve having meshes of 1.5 millimeters in diameter. Dry the product at a gentle heat, and preserve it in well-closed vials.

Collodium Stypticum. Styptic Collodium (Richardson's).

Tannic acid	2
Stronger alcohol	5
Collodion	20
Tincture of benzoin	2

Dissolve the tannic acid in the alcohol, then add the other ingredients.

Cotoïnum. Cotoïn (the active principle of Coto-bark).

Cotoïn crystallizes in anhydrous, pale-yellow prisms, melting at 130° C., having a sharp and biting taste, and easily soluble in stronger alcohol, chloroform, benzol, and disulphide of carbon, almost insoluble in petroleum ether. Cold water dissolves it sparingly, boiling water more freely. Alkalies and their carbonates dissolve cotoïn easily; by acids it is again precipitated. When warmed with nitric acid, cotoïn yields a blood-red liquid, and its alcoholic solution is rendered dark-violet by ferric chloride.

Dextrinum. Dextrin.

Potato starch	150
Oxalic acid	4
Carbonate of calcium	q. s.
Distilled water	q. s.

Mix the potato starch with the oxalic acid and 750 parts of distilled water and heat the mixture, while stirring, on the water-bath, until it is no longer rendered blue by solution of iodine. Then add to it 450 parts of warm distilled water, and afterwards a sufficient quantity of carbonate of calcium (about 5 parts), to neutralize the acid. Let the mixture stand for 2 days, filter and evaporate the filtrate on the water-bath, until the residue is no longer sticky. Divide the mass in small pieces, dry it at a gentle heat, and rub it to powder.

A white or yellowish-white powder, completely soluble in an equal weight of water, insoluble in strong alcohol. Addition of strong alcohol to the aqueous solution precipitates it. The aqueous solution is not precipitated by chloride of calcium, oxalate of ammonium, or acetate of lead.

Elixir Viscerale Kleinii. Klein's Stomachic Elixir.

Extract of Carduus benedictus	1
Extract of Erythræa Centaurium (Herba Centaurii Minoris.)	1
Extract of gentian	1
Tincture of orange peel	20
Malaga	32

Extractum Cinchonæ Liquidum (De Vrij). Liquid Extract of Cinchona.

Red cinchona (bark of stem of Cinch. succirubra, grown in Java or India, and containing at least 6 per cent of alkaloids), in fine powder	100
Normal hydrochloric acid (volumetric standard)	38
Glycerin	20
Water	362

Macerate the cinchona with the acid and water, for 12 hours, occasionally stirring. Whenever the foam has disappeared, add the glycerin and transfer the whole to a percolator, the orifice of which is closed with a linen plug. When the liquid runs off clear, continue the percolation with water until the liquid is no longer precipitated by solution of soda, and evaporate the percolate, on the water-bath, until it amounts to 100 parts.

The extract is clear, bright-yellow, and yields a clear solution with water. 10 parts of the extract mixed with a solution of 1 part of acetate of sodium or potassium in 6 parts of water, yield a copious, light flesh-colored precipitate of kinotannate of quinetum. The quantity of this precipitate, when collected on a filter, washed with a little water and dried, on the water-bath, in a tared capsule, should amount to 0.7 parts. When mixed with a large quantity of strong alcohol, the extract becomes very turbid and deposits a viscid, colorless calcium salt. If this is not the case, too much acid has been used in its preparation.

Extractum Cinchonæ Spissum (De Vrij). Inspissated Extract of Cinchona.

Evaporate the liquid extract of cinchona on the water-bath, until the weight does not diminish any more sensibly. 100 parts of the liquid yield about 57 parts of the inspissated extract.

It is of the consistence of thick honey, yellowish-red, and yields a clear solution with water in all proportions.

Extractum Fuci Vesiculosi. Extract of Seawrack.

Seawrack, dried and powdered	1
Stronger alcohol	3
Water	5

Mix the seawrack with 2 parts of stronger alcohol and 3 parts of water, and let it stand for 3 days, occasionally shaking. Then express, and treat the residue, for 1 day, in the same manner with stronger alcohol 1 part and water 2 parts. Express again, unite and filter the liquids, and evaporate them, on a water-bath, to a dry extract.

Extractum Geoffroyæ Surinamensis. Extract of Surinam Worm-bark.

Bark of Geoffroya surinamensis, in fine powder	q. s.

Mix it with water to a thin paste, and let it stand 24 hours, occasionally stirring. Then express the liquid, and treat the residue in the same manner, but with a smaller quantity of water. Strain and evaporate, on a water-bath, to a dry extract.

[The bark of *Geoffroya surinamensis* Murr. (*Andira retusa* Kuth.) is a powerful vermifuge. It contains an alkaloid which was named *surinamine* by its discoverer Hüttenschmid, in 1824, and afterwards *geoffroyine*.—ED. N. R.]

Extractum Ergotæ Dialysatum (Wernich). Dialyzed Extract of Ergot.

Ergot, in powder, and freed from oil of ergot	5
Distilled water	a suff. quantity

Mix the ergot with 15 parts of the water and let it stand for 24 hours, frequently stirring. Then transfer it to a densely-woven, moistened strainer, and pour the strainings back until they run off completely clear. Let all the liquid drain off, then pour upon the residue distilled water, until the strained liquid is almost colorless and tasteless. Evaporate the more concentrated, first part of the strained liquid, at once on the water-bath to the consistence of thin syrup, and also bring the more dilute, second part, to the same condition as quickly as possible. Unite the residues and evaporate the mixture on the water-bath, until it amounts to 6 parts.

Transfer this to a dialyzer, and continue the dialysis with distilled water, until no more passes through the membrane. Then evaporate the dialyzed liquid (that is the distilled water containing the crystalloids, etc., in solution) on a water-bath to a *thin* extract.

Gossypium Aërophorum. Carbonated Cotton.

Purified cotton	q. s.
Citric acid	19
Bicarbonate of sodium	25
Distilled water	q. s.

Dissolve the citric acid in 250 parts of distilled water, and saturate with the solution a suitable quantity of cotton.

Also dissolve the bicarbonate of sodium in 250 parts of water, and saturate with it another lot of cotton, of the same weight.

Dry each lot separately, then mix the two lots and preserve them in glass-stoppered bottles.

Gossypium cum Acido Borico. Borated Cotton.

Purified cotton	q. s.
Boric acid	10
Water	90

Dissolve the boric acid in the water by heating to a temperature of about 60° C. Saturate the purified cotton with the solution, wring it out, dry it, pick it, and preserve it in well-closed vessels.

Gossypium cum Acido Salicylico. Salicylated Cotton.

Purified cotton	100
Salicylic acid	10
Stronger alcohol	100
Glycerin	1

Dissolve the acid in the alcohol, add the glycerin, and saturate the cotton with the solution. Dry the latter in the air, pick it, and preserve it in well-closed vessels.

Gossypium cum Iodo. Iodized Cotton.

Iodine	1
Purified cotton	12

Wrap the iodine in filter paper, place this on the bottom of a wide-mouthed bottle, next introduce the cotton, and insert the stopper. Let the flask stand in a moderate warm place until the cotton appears to be colored uinformly by the iodine.

Preserve it in a glass-stoppered bottle, in a cool place, protected from the light.

Gossypium cum Iodoformo. Iodoformed Cotton.

Iodoform	2
Ether	10
Stronger alcohol	20
Glycerin	10
Purified cotton	30

Dissolve the iodoform in the ether and alcohol, add the glycerin, and saturate the cotton with the solution. Dry the latter in the air, pick it, and preserve it in glass-stoppered bottles.

Gossypium Purificatum. Purified cotton.

Macerate commercial cotton batting in benzin for ten minutes, press it, and dry it in the air.

[To be continued.]

Ammonium Bromide.

J. M. EDER has investigated some properties of pure ammonium bromide. Its spec. grav. in the crystalline state is 2.327, after sublimation, 2.3394. The salt is not altogether stable in presence of light and air; it turns a golden color, and then contains hydrobromic acid and free bromine.

The author found that a decrease of temperature is produced when ammonium bromide is dissolved in water. The following are the values of the solubility of one part of the salt in water:

at	10°	16°	30°	50°	100°
	1.51	1.39	1.23	1.06	0.78

One part ammonium bromide requires 32.2 [?] parts of alcohol at 15°, and 890 [? ED. N. R.] parts of boiling alcohol. Aqueous ammonium bromide solution of various concentration showed the following specific gravities:

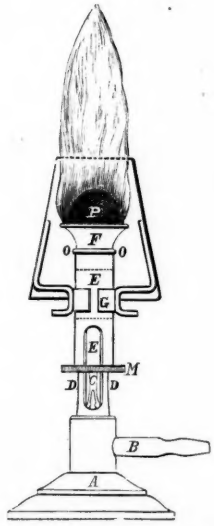
P. c. am. brom. in sol.:	5	10	15	20
Sp. gr. of sol. at 15°:	1.0326	1.0652	1.096	1.1285

The dissociation of ammonium bromide solution begins at 16°, and is very marked at 30°. Quantitative experiments were made with a view of determining the amounts of ammonia obtained by the distillation of an ammonium bromide solution (3.100). The amounts of ammonia so given off decrease after each successive distillation, in proportion as the hydrobromic acid remaining in solution increases. An alcoholic solution of ammonium bromide evolves ammonia on boiling. On heating dry ammonium bromide, which always shows an acid reaction, large quantities of ammonia are evolved at the commencement of the sublimation.—*Wien. Akad. Ber.*, 82, 1284 in *Journ. Chem. Soc.*

Muencke's Gas-Burner for Producing High Temperatures.

DR. ROBERT MUENCKE has constructed a new gas-burner which is said to produce a very high temperature suitable for fusions, etc., in laboratories. This is accomplished by attaching to the upper opening of a Bunsen burner a short tube gradually expanding and surmounted by a convex hood of wire-cloth, whereby the flame is subdivided into a compound of a great number of small blue flames (instead of consisting of a large central core of unconsumed gas and an exterior flame). The production of a good flame, devoid of luminousness, is, however, also dependent upon a proper supply of air.

In the accompanying illustration, A represents the base of the burner, B the gas-nipple, D a tube screwed into the socket and provided with three longitudinal slits. M is a disk fastened to the tube as a handle. Over the tube D fits another, E, which is twice as long and has openings corresponding to those in the tube D. G is a movable ring



Muencke's High-Temperature Gas-Burner.

bearing curved wires for holding the draft-chimney, and F is the burner-attachment with the convex head P. Before lighting the gas, the three lateral slits in the tube D are covered; by gradually turning the tube E, the admission of air is regulated, until the inner cone of the flame becomes smaller and finally disappears entirely, after which the flame will consist of a number of hemi-globular, bright-blue, independent flames of great heat-power.—*Dingl. Polyt. Journ.*, 241, 380.

Borate of Quinoidine.

DOCTOR DE VRIJ, after many years' endeavor to introduce quinoidine in a suitable form into medicine, considers that he has at length attained his object by combining the amorphous alkaloid contained in crude quinoidine with boric acid.

[The method followed has already been published in this journal, 1881, p. 170. See also this number, p. 11.]

Borate of quinoidine is an amorphous powder, more or less yellow, and very slightly hygroscopic. It is soluble in three parts of cold water, and the solution is decidedly alkaline. Its solubility and alkaline reaction give it a superiority over the sulphate of quinine in hypodermic injections. 100 parts of borate contain at least 54 parts of pure quinoidine. The right-hand molecular rotation varies

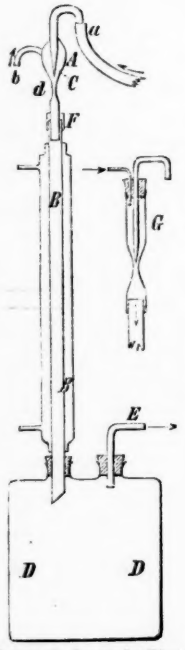
from 10° to 20,° being a means of ascertaining the genuineness of the preparation.

Considering the received opinion as to the cause of marsh fever and the antiseptic properties of boric acid, this combination of boric acid with the amorphous alkaloid of the cinchonas may reasonably be expected to prove useful, particularly in those countries where fevers are endemic, and where the high price of sulphate of quinine is often an obstacle to its use. Whereas the sulphate costs at the present moment 500 francs the kilo, the new febrifuge will not exceed 40 francs. Dr. Hermanides has tried the remedy in Holland, and gives a favorable report.—*The Chem. and Drugg.*

A Simple and Effective Apparatus for Fractional Distillation.

THE knowledge of the fact that the production of a high-grade alcohol depends upon a frequently repeated rectification and dephlegmation, has led to the construction of numerous forms of apparatus, all of which are more or less effective on a manufacturing scale, but almost generally unsuitable for laboratories, when working on a small scale.

Hempel's Apparatus for Fractional Distillation.



Thoerner's Steam-Jet Blast.

By following the principles laid down by Ilgen for the construction of stills, Mr. Walther Hempel has devised a simple rectifying apparatus of great efficiency, which is here illustrated: *a* is an ordinary flask, *b* a wide glass tube, which is completely filled with glass pearls of about 4 *mm.* diameter; *c* is a three-way tube, which is connected with the condenser by the leg *d*, and bears a thermometer in *e*. To prevent the glass-pearls from falling out of the tube, the lower end of the latter (at *f*) is somewhat contracted in the flame. This author succeeded, with this arrangement, to obtain alcohol of 95%, at *one* distillation, from alcohol of 18%. The liquid in the flask *a* should boil only gently, since otherwise the vapors would not be sufficiently cooled off on passing over the glass-pearls.—*Zeitschr. f. Anal. Chem.*, 1881, 502.

On a Simple Steam Jet Blast for Chemical Laboratories.

STEAM, generated—if not otherwise available—in a small copper boiler, and of a pressure of about five pounds, is conducted through a strong rubber tube to the jet A, which may be made of glass, in the usual manner, having an inner tube ending in a fine orifice of about one millimeter in diameter, situated directly over the contracted neck at *d*, which has an inner diameter of 2 to 2.5 millimeters. Beyond *d* the tube expands again and is connected at F with a condenser. The steam issuing from the point C carries with it a considerable quantity of air, admitted through *b*, and on its passage through the condenser is reconverted into water which collects in the two-necked Woulffe's bottle below, together with the air, which is under pressure. If the apparatus is to be used as a blast, the tube *b* is left open, and the exit at E connected with the blow-pipe. If it is to be used as a vacuum-pump, the exit at E is left open, and the tube *b* connected with the vessel to be exhausted. Instead of the form of jet, shown at A, which is entirely constructed of glass, the form at G may be used, which may be put together from portions of apparatus available in every laboratory.—W. THOERNER in *Repert. f. Anal. Chem.*, 1881, 246.

Lycopodine; the First Alkaloid Obtained from Angiosporous Cryptogams.

WHILE the phanerogams or flowering plants annually contribute to the list of newly discovered alkaloids, with the exception of muscarine and amanitine, no alkaloid has as yet been definitely recognized amongst the cryptogams.

Karl Bödeker, of Göttingen, has opened the road in this direction, and gives in a paper sent to Liebig's *Annalen der Chemie*, August 15th, 1881, the following account of an alkaloid, which, from the name of the plant in which it occurs, he calls lycopodine. The plant yielding the alkaloid, *Lycopodium complanatum*, belongs to the group of angiospermous cryptogams. It is distributed throughout the whole of north and middle Europe, and contains the largest proportions of aluminium of any known plant. Its bitter taste led the author to suspect an alkaloid in it.

To prepare the alkaloid, the dried plant is chopped up, and twice exhausted with boiling alcohol of 90 per cent. The residue is squeezed out while hot, and the extract, after being allowed to settle awhile, is decanted off, and evaporated to a viscid consistency over a water-bath. This is then repeatedly kneaded up with fresh quantities of lukewarm water until the washings cease to taste bitter, and to give a reddish-brown coloration when treated with a strong aqueous solution of iodine. The several washings are collected and precipitated with basic lead acetate, the precipitate filtered off, and the lead in the filtrate removed by sulphuretted hydrogen. The filtrate from the lead sulphide is evaporated down over a water-bath, then made strongly alkaline with a solution of caustic soda, and repeatedly shaken up with fresh quantities of ether so long as the washings taste bitter and give a precipitate with iodine water. After distilling off the ether, the residue is treated with strong hydrochloric acid, the neutral or slightly acid solution filtered off from resinous particles, slowly evaporated to crystallization, and the crystals purified by repeated recrystallization. To prepare the pure base, a very concentrated solution of caustic soda and pieces of caustic potash are added, whereupon the free alkaloid separates out, first, as a colorless, resinous, stringy mass, which, however, upon standing, turns crystalline, forming monoclinic crystals similar to tartaric acid or glycocol. The crystals are rapidly washed with water, and dried between soft blotting-paper.

Thus prepared, lycopodine has a composition which may be represented by the formula $C_{32}H_{52}N_2O_3$. It melts at 114°–115° C. without loss of weight. It is tolerably soluble in water and in ether, and very soluble indeed in alcohol, chloroform, benzol, or amyl alcohol. Lycopodine has a very pure bitter taste. The author has formed several salts of the base, all of a crystalline nature, and containing water

of crystallization. The hydrochlorate gives up a part of its water of crystallization at the ordinary temperature under a desiccator over sulphuric acid, and the whole of it upon heating.—*The Chem. and Drugg.*

The Alkaloids of Nux Vomica.*

In a paper read before the Pharmaceutical Society (*Pharm. Journ.*, December 8th, 1877), Mr. W. A. Shenstone mentioned some substances which apparently had been produced by the action of water containing a very small proportion of acetic acid on brucine heated with it, in the course of attempts to free the brucine from strychnine by crystallizing from hot aqueous solutions containing small quantities of its acetate.

On endeavoring to obtain the same products on a large scale from another specimen of commercial brucin, he was only partly successful, and, thinking his former results might have been due to some difference in the alkaloid, as, for instance, the presence of impurities, he decided that it would be well to prepare a specimen of brucine by a process so devised that heating should be avoided as far as possible, and heating with alkalies or acids altogether. It then seemed to him that, as the researches on which our present knowledge of the alkaloids of nux vomica is based, were made with material which had been prepared by the old processes, and, as it is quite certain that these alkaloids are much affected by saponifying agents, it would be well to take the opportunity of re-examining at least brucine, which is most readily attacked. He also thought that, by making his examination as exhaustive as possible, he might hope to do something more towards finally setting at rest the question of the existence of a third alkaloid, *igasurine*, in nux vomica seeds. With the kind aid of Messrs. Hopkins and Williams, fifty six pounds of the seed of Strychnos nux vomica were powdered, exhausted with alcohol, to which one-sixth part of water had been added, and the bulk of the spirit recovered. The product, in the form of a not very thin extract, was mixed, when cold, with four gallons of water, containing three-tenths per cent of sulphuric acid, which dissolved the alkaloids, leaving the greater part of other organic substances behind.†

The acid solution separated from the undissolved matter was mixed with excess of sodium carbonate, and, after a few hours, the precipitate was collected. The mother-liquors which retained a large quantity of alkaloid, were examined fully by a process which will be described later.

The precipitate produced by potassium [sodium ?—Ed. N. R.] carbonate was dissolved in chloroform, and the solution extracted by thoroughly washing with water, to which sulphuric acid was added gradually during the process, the first washing being withdrawn whilst still alkaline, in order to avoid crystallization, which was apt to occur rather easily with strong, and, at the same time, acid solutions; the subsequent washings were made with excess of acid. The solution of brucine sulphate thus obtained was still far from pure, and, when alkalies were added to it in the ordinary way, gave a very unsatisfactory precipitate; but, when the solution was placed in a shallow dish, with a beaker containing some diluted solution of ammonia in the centre, and the whole was covered up pretty closely, the gradual action of the ammonia caused the alkaloids to separate in crystals, which it was easy to deal with afterwards.

The portion of the bases which had been got in the crystalline state in this manner, was treated with dilute spirit, to dissolve the brucine, and the solution allowed to evaporate spontaneously. A crystalline mass of brucine then remained, which still contained much strychnine. It was dissolved in dilute sulphuric acid, added in such quantity as to leave a faintly alkaline solution, and precipitated with potassium iodide; the hydriodide of brucine was re-crystallized as often as necessary from alcohol, and finally the alkaloid was regenerated by agitating the solid hydriodide with solution of sodium carbonate, and shaking up with chloroform; finally, the chloroform solution was extracted with dilute acid, and the base precipitated with ammonia.

This mode of purification answered admirably. The brucine obtained did not yield any evidence of the presence of strychnine, when it was treated with diluted nitric acid, and the product examined for that substance, thus confirming the results previously obtained on distinct lines of experiment by A. J. Cownley (*Pharm. Journ.* [3], vi., 841) and the author when they examined the alleged conversion of brucine into strychnine by the action of nitric acid (Sonnenschein, *Pharm. Journ.* [3], vi., 201, etc.), and it easily yielded the acetate in crystals on spontaneous evaporation of a solution of the base in acetic acid. This salt has been previously described as existing only as a gummy residue (probably owing to traces of impurity in the alkaloid from which it was prepared); it is not very stable, quickly showing a slight change of color.

As the alkaloids which remained in the mother-liquor, when the greater portion was in the first instance precipitated by sodium carbonate, were considerable in quantity (90 grams), and as they would contain, besides the brucine and strychnine, the third alkaloid, if there be one, I examined the bases from this portion very carefully by the following method: The alkaline liquid was washed with chloroform till it was free from bitterness, and no longer gave any precipitate with tannin; the chloroform solution obtained was extracted with acid as before; the acid solution precipitated by exposure with dilute spirit. The alcoholic solution yielded the greater part in crystalline form on spontaneous evaporation, but a quantity remained in the aqueous mother-liquor, which could be partly removed by washing with chloroform, and partly not.

1. The crystalline portion was converted into hydriodide, recrystallized from alcohol, and regenerated as before, but with this difference: that the final precipitation with ammonia of a large part of it was done fractionally, so as to yield the alkaloid in three fractions: A 1, A 2, A 3, a small portion (one to five per cent) remaining in solution. This part was only examined qualitatively. It exhibited no point of difference from the rest.

2. The portion of the alkaloid extracted by chloroform from the aqueous mother-liquor of the portion which crystallized, after purification by re-crystallizing the hydriodide, and regenerating in the manner described, was dried at 105° to 107° and analyzed.

3. There remained for consideration the contents of the mother-liquor from which everything that chloroform would extract had been removed. This liquid gave, on slow evaporation, good-sized brown crystals, of a substance which, from its apparently definite character, puzzled the author a good deal for a time. It appears to be very similar to a substance which, for the sake of distinction, he called a "new brucine salt" in a slight notice of a very small quantity of it obtained a few years ago (*Pharm. Journ.*, Dec., 1877). It forms in good-sized crystals from impure solutions, but I have failed to get them so large after recrystallizing.

The author then details the results of his analyses, which tend to disprove the existence of the bases (igasurine, *a*, *b*, etc.) described by Schützenberger, and show the substance to be identical with brucine.

The results of the analyses leave no doubt that the formula for brucine, $C_{23}H_{26}N_2O_4$, already accepted, is correct, and hence it appears that brucine employed by previous experimenters, prepared by the old process, was not a saponification product of the alkaloid present in the seeds, not mixed with any such substances, but that the alkaloid in the seeds is identical with that which they obtained. Mr. Allen found, in experiments described further on, that brucine is without doubt profoundly affected by heating with acids, alkalies, or even water, but with one exception the products are amorphous, resin-like bodies, from which unaltered brucine is easily separated in a pure state. He has little doubt, however, that the ordinary processes are very wasteful from the following facts: From fifty-six

* Abstracted from *Journ. of the Chem. Soc.* (London, 1881), xxxix., Sept., 453.

† This method was adopted after repeated trials on a small scale, which showed that, on account of the large amount of mucilaginous substances in the seeds, a tolerably economical method of extraction without the use of spirit was impossible, and, of course, the use of alcohol made it necessary to remove it subsequently by heat, as brucine is very freely soluble in that liquid.

pounds of nux vomica seeds in the above operations, Mr. Allen obtained in all a little more than twenty ounces of mixed crystalline, though not perfectly pure alkaloids; an amount corresponding to about 2¼ per cent.

The recorded proportions of brucine and strychnine, taking the improbable event of both being at their maximum, are 1.5 per cent in all (*Pharmacographia*), so that the yield was certainly some 33 per cent above that previously recorded, and perhaps exceeded it still more. On the other hand, it is questionable whether the troublesome nature of his process would not take from it any advantage it may possess when applied on a large scale.

Bully-Tree Gum.

THIS gum, the hardened juice of *Sapota Muelleri* Bl., also called *balata* or *tuno gum*, or *leche de popa*, is much used by manufacturers of submarine cables and also by manufacturers of chewing gum. It is also called Gum Chicle, and is worth about 18 to 20 cents per lb., though it is not a regular article of trade, so far as we know.

In connection with this, we can give an interesting extract from a late report of Mr. Wm. C. Burhard, U. S. Consul at Ruatan, Honduras:

"The balata gum or tuno, as it is called in this country, is prepared from the milk of a tree which closely resembles that which produces India rubber, and it seems to be an intermediary between caoutchouc and gutta-percha. Large quantities of the gum have recently been imported into England and Germany, from the west coast of Africa, and it is being successfully employed in the manufacture of submarine cables, and for other purposes. Specimens of the gum have at different times been sent home from this country to the United States, but as the process of preparing the milk was not known, the specimens were black and sticky, and if any experiments were made with them by manufacturers, they were not sufficiently satisfactory to create a demand.

The specimens recently sent by me to the State Department at Washington were prepared by a simple process, which leaves the gum white, dry, and hard, and will commend itself to the attention of manufacturers who employ either gutta-percha or India-rubber, combining, as it does, the elements of both."

The supply of India-rubber from this part of tropical America is constantly decreasing, as the natives, with a want of economy peculiar to themselves, have adopted the practice of felling the trees, so as to obtain all the milk at once, instead of subjecting them to a series of bleedings and allowing them to recover after each operation.

The trees which produce the balata or tuno-gum are very abundant on the Atlantic slope of all the Central American republics, as well as in other tropical regions. Large quantities can be supplied at a cost considerably below that of either rubber or gutta-percha, and as repeated experiments in Europe have proven that it can be employed as a substitute for them, either alone or in combination, I see no reason why it should not receive the prompt and careful investigation of American manufacturers. I should be happy to furnish further information on the subject and to contribute as far as I am able towards its introduction into the United States.

Licorice Root in Spain.

THERE are several districts in Spain in which licorice root is obtained, and large exports are made from Spanish seaports to the United States. France also consumes large quantities of this root in the manufacture of licorice paste, and probably takes nearly as much as the United States. This root is used in the United States principally for sweetening in the manufacture of plug and other kinds of tobacco; besides it is used for medicinal purposes. It grows wild in the lower lands, in marshy ground, and on the banks of rivers. Probably the best quality obtained in Spain is found in the provinces of Aragon, Murcia, and Toledo. The very best Spanish licorice root is found near the margin of the Ebro, in Aragon. The next in point of quality is obtained near Cordova. Where it once takes root it is almost impossible to eradicate it. It grows in many countries, and varies in quality according to soil. Spanish licorice differs quite materially in the several provinces, the principal variations being that in some parts the bark is red, brown, or light-colored, the inside varying from light yellow to brown; the proportions of sugar and starch vary also. Many kinds are fibrous, while others are almost as hard as wood. The ground is pulled at intervals of three, four, or five years, according to circumstances, by digging trenches, pulling everything visible as long as possible until it breaks. After a year or two it shows above the ground with a little stem; in the spring, over this stem there are flowers. From the time this stem appears, until the flowers have fallen off, this root is not in condition to extract, for the sap does not return to the root until then. Each year, till the ground is culled, the quantity of roots and tops increases, until the ground is unfit for cultivation of any kind.

It is from September till March that the root is gathered, and goes through a process of drying or curing before it is considered marketable. Licorice root is also found and gathered in Asiatic Turkey,* Greece, Italy, and the Sicilies [and Russia]. In Italy and the Sicilies, very little, if any, is exported as root, it being used in the manufacture of roll or stick licorice. There is a small section in England which produces a limited quantity. The United States also have licorice root in several parts of the country, but the quality is not such as to give it value.

The quality of root produced in the different countries is as follows: Asiatic Turkey, decidedly bitter; Greece, bitter, but not so bitter as Asiatic Turkey; Sicily, sweet, but less so than Spanish; Spain, rich and sweet; Italy, richest and sweetest of all.

Malaga has not, up to the present season, been considered an important shipping port for the root; Seville, Alicante, Barcelona and Bilbao being nearer the producing districts. It is probable that, during the coming year of 1881, there will be some shipments from Malaga.

The value of this root does not admit of its being increased in crop by cultivation, and the quantity gathered depends greatly upon the severity or mildness of the winter. If severe, it lessens the quantity gathered. Again, if other crops are good, labor being scarce, less root is gathered; consequently, prices are higher. There are one or two large French establishments in Spain for making paste and stick licorice—one in Seville and the other in Saragossa; besides, a few small Spanish concerns also engage in the manufacture of licorice paste.—*U. S. Consul* H. C. MARSTON, *Report to State Department.*

Durable Labels for Stock-bottles.

ORDINARY glazed paper, preferably of a citron-yellow color, is wiped over with a damp sponge, and then again allowed to dry.

The ink used for writing the labels is prepared from three parts of extract of logwood and one part of bichromate of potassium, dissolved in thirty parts of water. After standing until it has become clear, the liquid is decanted from the sediment, and two parts of gum-arabic are then added.

When the writing has become dry, the label is affixed to the receptacle by means of a glue-paste, prepared by pouring a boiling solution of carpenter's glue into a cold-prepared paste made from wheat-flour and water.

When the label has become dry, it is brushed over twice with the same glue-paste, the second application being delayed until the first is dry.

Finally, the label is varnished over with damar varnish containing ten per cent of Canada balsam.—R. TRIEST, in *Pharm. Zeit.* and *Neueste Erf. und Erf.*

* About 14,000 tons of roots are exported annually from Asia Minor, a considerable portion of which is sent to the United States. Licorice paste also forms an important item there, about 25,000 tons being the average annual export.

The average prices of the roots are about $1.60 per cwt., and that of the paste $8 per cwt.—*Report of U. S. Consul-General* HEAP *of Constantinople.*

Opium Trade.

THE *Chemist and Druggist* publishes the following report in its November number:

Respecting opium, Messrs. Barry & Co. write as follows on November 2d, 1881:—Our market during the month of October followed the lines which we anticipated in our last report. At the beginning, the strong demand ruling for America and Holland maintained the price of Carahissar at 118 piastres, and in the first two weeks sales of 250 cases were concluded. In the middle of the month, buyers were indisposed to go on at preceding figures, and holders had to facilitate business by some concessions up to the 20th, when 130 cases were sold at 115 piastres. Bogaditch and Yerli, however, have not been similarly affected, as these kinds are not abundant on the market.

Subsequently, the market was fairly firm, without any sensible change and with fair activity until last week, when new spirit in demand brought back the rates of prices paid to 118 piastres.

As we have mentioned in our former reports, our quotations have not fallen to what might have been looked for, in consequence of the abundance of the crop—a result due to the special intensity of the demand for the article. This condition is likely to continue, unless buyers should completely abstain from transactions for two or three weeks, and, thus cooling the market, bring down holders from their present demands.

Since our prices have gone beyond 110 piastres, the extreme east has ceased to operate here. The demand for America has also diminished. It is Holland, chiefly, which continues to buy at present rates. Whether the actual purchasers pay these prices, or whether they are the effect of previous contracts entered into with the Dutch Company, is not certain. Any way, the demand for Holland continues active.

The sales for the month amount to 473 cases, plus 170 Tale-quale and Chiquinti. The total sales for this season amount to 2,896, plus 968 Tale-quale and Chiquinti. The arrivals during October reached 781 cases. Total arrivals this season, 5,152.

Up to October 19th, 2,978 cases have been shipped from Smyrna, distributed as follows:

	Cases.
To London	624
" Liverpool	771
" America	794
" Amsterdam	300
" Hong Kong and Singapore	343
" Continent	113
" Batavia	33
	2978

At Constantinople, up to October 19th, the arrivals had reached 2,002 cases, and sales 1,500 cases.

The following are our closing quotations:

	Per pound f. o. b. P. S.	*s. d.*	*s. d.*
Bogaditch	130	14.6	to 00
Yerli	122	13.7	to 00
Carahissar	118	13.2	to 00
Common	115–116	12.10	to 10.0
Tale-quale and Chiquinti	98–107	10.11	to 11.11

Mr. Richard Barker (Smyrna) states that, of the 4,400 baskets remaining in the producing districts, about 2,000 will be kept in the interior until the month of March, 1882.

Distinction of Wool, Silk, and Cotton.

A. REMONT communicates a short process to detect or separate these fibres, which may suffice for ordinary purposes. The fabric to be examined is first dipped, for fifteen minutes, in boiling water containing 5 per cent of hydrochloric acid, for the purpose of removing coloring matter and sizing; it is then washed and dried. If at all possible, the woof is then to be separated from the warp, and each examined separately, according to the following scheme:

I. Burn a few fibres.

1. An odor of burnt urine is developed. If this is the case, heat a few fibres with solution of soda, and examine the vapor given off; if ammonia is present, this indicates the presence of an *animal fibre*.
   - *a*. Dip a few fibres into a boiling solution of basic chloride of zinc.
     - α. The fibre dissolves completely.—*Silk*.
     - β. On the addition of hydrochloric acid, an abundant flocculent precipitate is produced.—*Silk* mixed with *wood* or vegetable fibre.
     - γ. The chloride of zinc does not dissolve it. Remove the fibres to a boiling, moderately dilute solution of soda.

       It dissolves completely.—*Wool*.

       It dissolves partially.—*Wool* and *cotton*.
2. No odor of burnt urine is developed.—*Vegetable fibre*.

—*Jour. de Pharm. et de Chim.*, 1881, 135.

Analysis of Public Water Supplies.

(Instructions for water analysis in England, prepared by a Committee appointed by the Society of Public Analists.)

(Continued from page 367, 1881)

THE hyposulphite solution must be standardized, not only at first, but (since it is liable to change) from time to time in the following way:—To 250 cc. or 3,500 grains of pure redistilled water add two or three drops of the solution of potassium iodide, and then 10 cc. or 100 grains of the standardized solution of potassium permanganate. Titrate with the hyposulphite solution as above described. The quantity used will be the amount of hyposulphite solution corresponding to 10 cc. or 100 grains as may be of the standardized potassium permanganate solution, and the factor so found must be used in calculating the results of the hyposulphite titrations to show the amount of the standard permanganate solution used, and thence the amount of oxygen absorbed.

The difference between the quantity of hyposulphite used in the blank experiment and that used in the titration of the samples of water multiplied by the amount of available oxygen contained in the permanganate added, and the product divided by the volume of hyposulphite corresponding to the latter is equal to the amount of oxygen absorbed by the water.

9. Hardness Before and After Boiling.—Place 100 cc. or 1,000 grains of the water in an accurately stoppered eight-ounce bottle. Run in the soap solution from a burette in small quantities at a time. If the water be soft, not more than 1 cc. or 10 grains at a time; if hard, in larger quantities at first. After each addition, shake the bottle vigorously for about a quarter of a minute. As soon as a lather is produced, lay the bottle on its side after each addition, and observe if the lather remains permanent for five minutes. To ascertain this, at the end of five minutes, roll the bottle half-way round; if the lather breaks instead of covering the whole surface of the water, it is not permanent; if it still covers the whole surface, it is permanent: now read the burette.

Repeat the experiment, adding the full quantity of soap solution employed in the first experiment, less about 2 cc. or 20 grains; shake as before, add soap solution very gradually till the permanent lather is formed: read the burette, and take out the corresponding hardness from the table. If magnesian salts are present in the water, the character of the lather will be very much modified, and a kind of scum (simulating a lather) will be seen in the water before the reaction is completed. The character of this scum must be carefully watched and the soap test added more carefully, with an increased amount of shaking between each addition. With this precaution it will be comparatively easy to distinguish the point when the false lather due to the magnesian salts ceases, and the true persistent lather is produced.

If the water is of more than 16° of hardness, mix 50 cc. or 500 grains of the sample with an equal volume of recently boiled distilled water which has been cooled in a closed vessel, and make the determination on this mixture of the sample and distilled water. In this case it will of course be necessary to multiply the figures obtained from the table by 2.

To determine the hardness after boiling, boil a measured quantity of the water in a flask briskly for half an hour, adding distilled water from time to time to make up for loss by evaporation. It is not desirable to boil the water under a vertical condenser, as the dissolved carbonic acid is not so freely liberated. At the end of half an hour, allow the water to cool, the mouth of the flask being closed; make the water up to its original volume with recently boiled distilled water, and, if possible, decant the quantity necessary for testing. If this cannot be done quite clear, it must be filtered. Conduct the test in the same manner as described above.

The hardness is to be returned in each case to the nearest half degree.

10. **Total Solid Matters.**—Evaporate 250 cc., or, say, $\frac{1}{20}$th gallon, in a weighed platinum dish on a water-bath, dry the residue at 220° F., and cool under a desiccator; weigh the dish containing the residue accurately, and note its color and appearance and especially whether it rapidly increases in weight; return to the water-bath for half an hour and reweigh until it ceases to lose weight, then gradually heat it to redness, and note the changes which take place during this ignition. Especially among these changes should be observed the smell, scintillation, change of color, separation of more or less carbon, and partial fusion, if any. The ignited residue is to be used for the estimation of phosphoric acid as before directed.

11. **Microscopical Examination of Deposit.**—The most convenient plan of collecting the deposit is to place a circular microscopical covering glass at the bottom of a large conical glass holding about twenty ounces. The glass should have no spout, and should be ground smooth on the top. After shaking up the sample, this vessel is filled with the water covered with a plate of ground glass and set aside to settle. After settling, the supernatant water is drawn off by a fine syphon, and the glass bearing the deposit lifted out, either by means of a platinum wire, which should have been previously passed under it, or in some other convenient way, and inverted on to an ordinary microscopical slide for examination. It is desirable to examine the deposit first by a $\frac{1}{4}$th and then by a $\frac{1}{8}$th objective. The examination should be made as soon as the water has stood overnight. If the water be allowed to stand longer, organisms peculiar to stagnant water may be developed and mislead the observer. Particular notice should be taken of bacteria, infusoria, ciliata or flagellata, disintegrated fibres of cotton, or linen, or epithelial debris.

It is particularly desirable to report clearly on this microscopical examination, not merely giving the general fact that organisms were present, but stating as specifically as possible, the names or classes of the organisms, so that more data may be obtained for the application of the examination of this deposit to the characters of potable waters.

It is also desirable to examine the residue left on a glass slide by the evaporation of a single drop of the water. This residue is generally most conveniently examined without a covering glass. The special appearances to be noticed are the presence or absence of particles of organic matter or organized structure contained in the crystallized forms which may be seen, and also whether any part of the residue left, especially at the edges, is tinted more or less with green, brown, or yellow. In connection with the microscopical examination it will also be desirable to adopt the sugar process described by Mr. Heisch, as follows:—

12. **Sugar Test.**—The name of this process relates simply to the reagent which is used, namely, pure crystallized sugar. It is believed to be a test for the presence of the germs or spores of the sewage fungus. This special form of fungus grows very rapidly in water containing even a small admixture of sewage water, especially if sugar be present. It grows as well in a closed bottle of the liquid being tested as in water exposed to the air, and even better in an atmosphere of carbonic acid. To apply the test. Take a five-ounce stoppered bottle which has been thoroughly cleaned and rinsed with the water to be tested. Fill with the water to be examined, add about ten grains, or say .5 grams of crystals of pure sugar, insert the stopper, and put the bottle in a good light; keep at a temperature of as nearly as possible 80° F. The water should be free from suspended matters before the experiment is made. The bottle must be carefully examined after two or three hours, and again, if necessary, at intervals. The fungus appears first in the form of minute floating white specks, which are generally easily visible to the naked eye, in a good side-light, when the bottle is looked at against a black back-ground. A pocket lens may sometimes be used with advantage. If any suspected speck is seen, it must be caught by a fine pipette and transferred to a glass slide covered and examined with a one-quarter objective and B eye-piece. When first seen, these specks are found to consist of small isolated cells with a bright nucleus. In the second stage, the form resembles a bunch of grapes. The bright nucleus is still seen. This second stage generally takes not more than from four to six hours for full development. A few hours after the second stage has become clear, the cells assume the form of moniliform threads. After this they assume the form of ordinary mycelium, with sparsely diffused cells. Finally, the cells disappear and leave only ordinary mycelium. When the proportion of sewage is large, it is often accompanied by a distinct smell of butyric acid. A few experiments on mixtures of small proportions of sewage matters with water will give sufficient data to enable this peculiar fungus to be readily recognized. The following is the form in which the analysis should be reported:

Description of sample.	Grains per gallon.
Drawn.	
Temperature when drawn.	
Appearance in two-foot tube.	
Smell when heated to 100° F.	
Chlorine in chlorides.	
Phosphoric acid in phosphates.	
Nitrogen in nitrates.	
Ammonia.	
Albuminoid ammonia.	
Oxygen absorbed in fifteen minutes at 80° F.	
Oxygen absorbed in four hours at 80° F.	
Hardness before boiling (Clark's scale).	
Hardness after boiling (Clark's scale).	
Total solid matter dried at 212° F.	
Microscopical examination of deposit.	
Remarks.	

Detection of Oil of Erigeron in American Oil of Peppermint.

MM. F. VIGIER and CH. CLOEZ have treated this question in the *Union Pharmaceutique*. The Canadian Fleabane, *Erigeron canadense*, is very common in the mint fields; it yields a much larger proportion of essence than mint, and this essence quickly turns brown on exposure, and possesses an herbaceous taste and smell *sui generis*. It is one of the chief causes of the inferiority of some samples of American oil.

The authors have examined its physical and chemical properties, and find that the following characteristics will indicate its presence to the extent of eight or ten per cent of peppermint oil in a sample. Concentrated caustic potash does not saponify Erigeron oil, but colors it orange-red in the cold; on heating, the color deepens till part of the oil separates as a reddish-purple viscid mass. This reaction does not show itself with oil freshly distilled at 170° C. Pure mint oils do not give this reaction; in the cold, caustic potash converts them into a white emulsion. On heating, the mixture takes a faint, clear, yellow tinge. But, if a few

drops of erigeron oil are introduced, the orange-red color appears quickly on shaking, and develops instantly if the tube is warmed. Mint oil is completely soluble, erigeron oil is completely insoluble in its own volume of 85 per cent alcohol at 15° C. If a suspected sample be agitated with an equal volume of 85 per cent alcohol, a milky fluid will be produced if erigeron oil be present, and the insoluble essence will separate in the course of twenty-four hours. The oils of Eucalyptus globulus and turpentine behave in much the same way, and the points which would distinguish the three substances have not yet been determined. But a specimen of mint oil, which rotates the polarized ray feebly to the left, makes a turbid mixture with its own volume of 85 per cent alcohol, and takes an orange-red tint with caustic potash, may be safely rejected.

Analyses of Liebig's Extract of Meat and of an Imitation of the Extract.

MR. C. ESTCOURT reports in *The Analyst* (1881, 200) as follows: A few months ago, I received a sample pot duly labelled, etc., purporting to contain the genuine *Extractum Carnis Liebig*, which I was informed had been imported into this country [England] from Italy. I was also informed, upon good authority, that the imitation was made principally from horse flesh, that it had been offered at a slightly reduced price, and had been purchased in considerable quantities by one or two large establishments in the city of Manchester. Being of opinion that the comparative analyses of both the genuine and the imitation might be of some value to public analysts in other towns where the article was offered, I obtained from a large firm of wholesale druggists here a sample of undoubtedly genuine Liebig's extract, to compare with the imitation. The latter, in general get-up, labels, signature, and every detail would inevitably deceive any one who merely judged by the appearance of the article.

	Percentage Composition. Imitation.	Genuine.
Total solid matter	82.0	88.0
Water	18.0	12.0
Fat	1.0	0.0
Total ash	23.10	21.31
Ash insoluble in water	1.32	1.48
Sodium chloride	14.21	8.12
P_2O_5 phosphoric anhydride, in soluble phosphates	1.765	4.627
H_2SO_4 Sulphuric acid in soluble sulphates	0.451	0.606
Alkalinity of soluble ash, expressed as NaHO	2.401	2.160

It will be observed that the main difference between these two samples are due to the excess of NaCl, and the deficiency in phosphoric anhydride, which, together with the presence of fat, characterize the imitation sample.

Papaine: A New Contribution to the History of Soluble Ferments.

IT has been shown that papaine, the soluble ferment of the *Carica Papaya* L., is closely connected with the albuminoids, both in its composition and chemical properties. Mr. A. Wurtz having made further researches, is now able to give some details regarding its digestive power, and to express an idea as to its mode of action.

0.1 gram of papaine was digested with 100 grams of moist fibrin, diffused in 500 *cc.* of distilled water, to which a few drops of hydrochloric acid were added. At the end of thirty-six hours, there was obtained for the mixture 2.5 grams of insoluble dyspeptone, 8.9 grams of parapeptone precipitable by alcohol, and a brown residue after evaporation, weighing 10.3 grams. This residue, when taken up again by water, no longer gave a precipitate on addition of nitric acid; but, on careful evaporation and standing, it eventually deposited crystals, which, after purification, presented the appearance of leucine. From this experiment it is evident that the papaine had dissolved one thousand times its weight of moist fibrin, of which the largest portion had been transformed into peptone not precipitable by nitric acid, and that, in consequence of the complete hydration of the fibrin, it had even formed a small quantity of an amido-body, the same being known to occur in the process of good peptic digestion.

In another experiment, 0.05 gram of the same papaine liquefied 100 grams of moist fibrin, or 2,000 times its weight, with the exception of a small residue of dyspeptone weighing 4.2 grams. In order to ascertain if the ferment was capable of assimilating water itself, a solution of 3 grams of papaine in 20 *cc.* of water was heated for fifteen days to 50°; after filtration and evaporation in a vacuum, it was precipitated by alcohol, and the modified papaine thus obtained was submitted to analysis. As was anticipated, the ferment had undergone partial hydration in such a manner that its carbon was lowered by about 2 per cent. Several similar experiments were made at various temperatures with like results, the extent of the hydration appearing within certain limits to proceed *pari passu* with the temperatures. The following experiment may, perhaps, throw some light upon the mode of action of the papaine. 0.3 gram was dissolved in 50 *cc.* of water, and 10 grams of fibrin digested with the solution. At the end of twenty minutes the liquid was expressed, and the fibrin subjected to prolonged washing with cold water. In the liquid obtained by the expression of the fibrin, a new portion of 15 grams was digested, and at the expiration of half an hour this second portion of fibrin was expressed, and washed as the first. Both portions (the first reduced to 7 grams by the beginning of digestion, the second to 14 grams) were digested at 40° with pure water, when both became dissolved, the second leaving a residue of 4 grams of moist dyspeptone.

In these two experiments, the washings had certainly removed the *dissolved* ferment, and the washed fibrin would not have been able to dissolve, except by the action of a portion of the ferment fixed upon, or, perhaps, combined with it; the ferment fixed upon the fibrin in an insoluble state had then redissolved it, in consequence of the hydration of the fibrin.

By the above and similar experiments, it was sought to establish that the papaine begins by combining with the fibrin, and that the insoluble product then gives, by the action of water, the soluble substances resulting from the hydration of the fibrin; at the same time, the ferment, being again set free, is necessarily at liberty to exercise its action on a new portion of fibrin.—*Comp. Rend.*, 91, 787, and *Journ. Chem. Soc.*

Preparation of Pure Colchicin.*

WHOLE colchicum seed is packed in a displacement apparatus and treated with successive portions of 85% alcohol, until the percolate has only a pale-yellow color. Four portions of alcohol, each sufficient to cover the seed, are enough. Finally, to extract the last traces of colchicin, a quantity of boiling alcohol is poured over the seed. The united, faintly acid liquids are mixed with calcined magnesia, the whole is well shaken, filtered after a few hours, and the filtrate distilled in a vacuum until a liquid extract remains. If the distillation is carried on at the ordinary pressure, a good deal of colchicin is lost, in consequence of the longer exposure to heat.

The contents of the retort are mixed with ten volumes of water, and the oily matter separating on top removed (which is best done in a burette or similar vessel). The liquid is then filtered and repeatedly shaken with chloroform until the latter remains almost colorless. It is easy to recognize by the taste whether any colchicin has remained in the liquid. When it is all removed, and the little chloroform remaining in the liquid has been driven out by heat, the liquid has a sweet taste.

* From the Inaugural Dissertation by JOHANN HERTEL: *Versuche ueber die Darstellung und Constitution des Colchicins und ueber die Beziehungen desselben zum Colchicein und einigen anderen Zerseizungsproducten.* (*Pharm. Zeitsch. f. Russland*, 1881.)

The chloroformic solutions are distilled until a syrupy residue remains, which is poured out on glass or porcelain plates and warmed for an hour at a temperature of 80° to 100° C., to completely dissipate the chloroform. The chloroform is retained by the colchicin with great obstinacy, and it is, therefore, absolutely necessary to spread it out in as thin layers as possible. When all the chloroform has evaporated, the residue ceases to be soft and waxy at 100° C.

This crude colchicin, which appears as an amorphous, brown, brittle mass, is purified by redissolving in twenty parts of water, whereby the coloring matter is left behind. The solution is filtered, and the filtrate (instead of being again shaken out with chloroform, according to Eberbach), at once evaporated in a flat capsule.

The yield of product, by following this process, was 0.38 to 0.41 per cent of the weight of the seed. The difference in yield which may be obtained from one and the same material is caused by the tendency of colchicin to decompose; for this reason, it is advisable never to let colchicin stand for any length of time in its solutions, and to complete the different steps as rapidly as possible.

A good yield can be obtained only by using *whole* seed. From powdered seed much less (about one-half of the former yield) is obtained, as the solution is loaded with so much foreign matter.

Elixirs and Medicated Wines.

We have frequent inquiries after the formulæ furnished by Prof. C. Lewis Diehl, of Louisville, Ky., and to satisfy the demand have concluded to republish the same.*

Elixir of Calisaya Bark.—The formula for this elixir I have already published in the *Am. Journ. Pharm.* (vol. xl.), but as it has escaped the notice of many of our members, I will here repeat it, with such modifications in the technical directions as may have occurred to me during my manipulations since then.

Take of

Calisaya bark	24
Curaçoa orange peel (ribbons)	16
Coriander	4
Cardamom	1½
Cinnamon	3
Anise	1
Cocoa (Baker's)	℥ 8

Reduce to a moderately fine powder, displace with a mixture consisting of one part, by measure, of strong alcohol, and three parts of water; obtain 2½ gallons of percolate.

Meanwhile, prepare from six pints of solution of tersulph. of iron, hydrated sesquioxide of iron, by the formula of the Pharmacopœia, measure it, and add to every four measures one measure of alcohol; then add of this sufficient of the percolate obtained as above, to deprive it of its cinchotannic acid. The absence of the latter is readily ascertained by the addition of a drop of muriated tincture of iron to a filtered portion of the liquid in operation, which should not be colored by such addition. Should coloration result, the intensity or faintness will serve as a guide to the further quantity of hydrated sesquioxide of iron necessary to completely detannate the preparation. As soon as this result is attained, strain the mixture upon a muslin strainer, and, when the liquid ceases to pass, wash the residue upon the strainer with sufficient of a mixture of 1 measure of stronger alcohol to 3 of water, to make the strained liquid measure 5 gallons. Now triturate together oil of orange (fresh) fl. ℥ ½ (or solution of fl. ℥ 5; see further on) carbonate of magnesium† ℥ 6. When thoroughly mixed incorporate it with the strained liquid obtained as above, agitate well, and filter through paper. Express the filter between muslin, filter the expressed liquid, and mix with the previous filtrate, in which dissolve 15 lbs. of sugar. If necessary filter the elixir thus obtained, but simple straining will usually answer.

Simple Elixir.

Take of

Oil of orange (fresh)	f. ℥ 1	(or solution	f. ℥ 10)
" cinnamon	♏ 10	(do.	♏ 100)
" anise	♏ 4	(do.	♏ 40)
" bitter almond	♏ 2	(do.	♏ 20)
Tinct. of cardamom	f. ℥ 10		
Stronger alcohol	O.2		

Dissolve the oils in the alcohol, add the tincture and triturate the solution with a previously powdered mixture of

Cocoa (Baker's)	℥ 1
Carb. magnesium	℥ 2

Then add gradually 4½ pints of water, transfer the mixture to a 1 gallon bottle, agitate occasionally for several hours and filter. Express the filter between muslin, filter the expressed liquid, mix with the previous filtrate, and dissolve in it three pounds of sugar. Filter or strain as may be necessary.

The simple elixir thus prepared has the color of dark Madeira wine, and an exceedingly pleasant taste. It serves as a vehicle for many medicines, disguising them to a great extent, and rendering them generally more palatable.

Wine of Orange.

Take of

Oil of orange (fresh)	♏ 5 (or solut. ♏ 50)
Alcohol	f. ℥ ½
Carbon. magnes	℥ ½

Triturate together and add

Syrup	f. ℥ 2
Sherry wine	f. ℥ 13½

Mix thoroughly and filter.

The wine obtained in this way has an agreeable flavor of orange. The use of carbonate of magnesium renders it neutral, and thus enables the introduction of medicinal compounds that are liable to decomposition in the presence of free acid.

Solutions of Essential Oils.—I have been in the habit of dissolving essential oils, that are liable to change, in alcohol, and have found these solutions very convenient for measuring minute quantities of oils. They are prepared by dissolving

Essential oil ..... 1 part (by measure) in
Alcohol ..... 9 parts.

Which strength is invariably meant, when in the formula I direct the use of *solutions of essential oils*.

Cochineal Color.

Take of

Cochineal	1
Carb. potassium	½
Powd. alum	½
Cream of tartar	1
Water	f. ℥ 8

Reduce the cochineal to a fine powder, add the carbonate of potassium and triturate in f. ℥ 3 of the water. Allow the mixture to stand one hour; add the alum and cream of tartar successively, and, when effervescence has ceased, the remaining water; filter. The solution imparts to the elixir a fine red color; it is, however, in some respects, unsatisfactory, as it soon spoils.

The above are all the preparations that need be kept in stock, and with them, and such other ingredients as are readily obtained by purchase, almost all the elixirs and wines now prescribed may be prepared extemporaneously.

The exceptions to these are:

Compound Elixir of Taraxacum, which, being recommended and used for the purpose of disguising the extreme bitterness of quinia, should be prepared according to the original formula of Mr. Candidus, as communicated by him to the American Pharmaceutical Association, and reprinted in most medical and pharmaceutical journals.

The other:

* From the original pamphlet which is out of print, and entitled *Formulas for some Elixirs and Medicated Wines, adopted by the Louisville College of Pharmacy, January* 16th, 1872, 8vo, pp. 9.

† It will probably be preferable to use precipitated chalk, as the carbonate of magnesium renders the liquid slightly alkaline.

Elixir of Pyrophosphate of Iron, Quinia, and Strychnia, requires particular manipulation, which precludes the use of *simple elixir.*

The following formula—the result of concert experiments of my friend, Mr. E. Scheffer, and myself—has been used by me since autumn, 1869, and I can recommend it as uniformly successful when the manipulatious are carefully conducted.

Take of

Sulphate of quinia	grains	60
Strychnia	grain	1
Citric acid	grains	5
Stronger alcohol	fl. oz.	3
Solution of oil of orange	♏	50
Syrup	fl. oz.	6
Pyrophosphate of iron	grains	240
Distilled water	fl. oz.	7
Aqua ammonia	q. s.	

Triturate the sulphate of quinia, strychnia, and citric acid together until minutely divided; then add the alcohol and solution of oil of orange. Warm the syrup slightly (to about 150° F.), and add to the turbid mixture; when, upon stirring, the mixture becomes clear. To this add the pyrophosphate of iron, previously dissolved in the distilled water, and, finally, carefully, water of ammonia (drop by drop), until the elixir is perfectly neutral to test-paper; filter.

The finished preparation has a greenish-yellow color, a pleasant flavor of orange, and is permanent.

Elixir of Calisaya Bark with Iron.—Take of pyrophosphate of iron 128 grains; soften in fl. ʒ 2 of water, and stir in gradually 1 pint of *elixir of calisaya bark;* filter.

Elixir of Calisaya Bark with Iron and Strychnia.—Dissolve 1 grain of strychnia and 1 grain of citric acid in fl. ʒ 2 of water; and 1 pint of *elixir calisaya bark with iron;* mix and filter.

Elixir of Calisaya Bark with Iron and Bismuth.—Dissolve 128 grains of pyrophosphate of iron and 128 grains ammonio-citrate of bismuth in fl. oz. 2 of distilled water; add fl. oz. 14 of *elixir of calisaya bark;* mix and filter.

Elixir of Calisaya Bark with Iron, Bismuth, and Strychnia.—Dissolve 1 grain of sulphate of strychnia in fl. ʒ 2 of water; add 1 pint of *elixir of calisaya bark with iron and bismuth;* mix and filter.

Elixir of Pyrophosphate of Iron.—Soften 256 grains of pyrophosphate of iron in fl. oz. ½ of water; add fl. oz. 15½ of *simple elixir;* mix and filter.

Elixir of Bismuth.—Dissolve 256 grains of ammonio-citrate of bismuth in 4 fl. oz. of distilled water; mix with 12 fl. oz. of *simple elixir,* and filter.

Elixir of Valerianate of Ammonium.—Dissolve 256 grains of valerianate of ammonium in 2 fl. oz. of *simple elixir;* carefully add water of ammonia until the solution is exactly neutralized; then mix with 14 ounces of *simple elixir;* filter and color with cochineal color to a bright red.

Elixir of Valerianate of Ammonium and Quinia.—Triturate 64 grains of valerianate of quinia until minutely divided; then dissolve it in 1 pint of *elixir of valerianate of ammonium,* and filter.

Elixir of Valerianate of Ammonium, Quinia, and Strychnia.—Dissolve 2 grains of strychnia in 2 fl. ʒ of water, by the aid of just sufficient valerianic acid; mix with 1 pint of *elixir of valerianate of ammonium and quinia,* and filter.

Elixir of Valerianate of Quinia.—Triturate 128 grains of valerianate of quinia until minutely divided; mix with 1 pint of *simple elixir;* carefully add valerianic acid until the liquid becomes clear, shaking after each addition, and filter.

Elixir of Valerianate of Quinia and Strychnia.—Dissolve 2 grains of strychnia (minutely divided) in 2 fl. oz. of water, by the aid of just sufficient valerianic acid; mix with 1 pint of *elixir of valerianate of quinia,* and filter.

Elixir of Valerianate of Strychnia.—Dissolve 3 grains of strychnia in 2 fl. ʒ of water, by the aid of just sufficient valerianic acid; mix with 1 pint of *simple elixir,* and filter.

Elixir of Bromide of Potassium.—Dissolve 1 oz. of bromide of potassium and 1 oz. of sugar in 1 pint of *stmple elixir;* add 20 minims of solution of oil of orange and 10 minims of solution of oil of bitter almonds, and filter. Color with cochineal color.

Elixir of Bromide of Sodium.—Prepare like elixir of bromide of potassium, substituting bromide of sodium for bromide of potassium, and omitting the color.

Elixir of Bromide of Ammonium.—Prepare like elixir of potassium, substituting bromide of ammonium for bromide of potassium, and omitting the color.

Elixir of Hops.—Add 2½ fl. oz. of fluid extract of hops—made according to formula for F. E. Gentian, U. S.—to 13½ fl. oz. of *simple elixir;* mix and filter.

Elixir of Lupulin.—Triturate 2 fl. oz. of fluid extract of lupulin with 2 ounces of carbonate of magnesium; add 14 fl. oz. of *simple elixir;* transfer to a bottle; agitate occasionally for several hours, and filter.

Elixir of Gentian and Pyrophosphate of Iron.—Triturate 100 minims of solution of oil of orange with 2 ounces of sugar; dissolve it in 8 fl. oz. of *elixir of pyrophosphate of iron* and 6 fl. oz. of *simple elixir;* add ½ fl. oz. of alcohol and ½ fl. oz. of fluid extract of gentian; mix and filter.

*Elixir of Chloral Hydrate.**—Dissolve 2 ounces of chloral hydrate in 1 pint of *simple elixir,* and filter.

Wine of Iron.—Dissolve 128 grains of ammonio-citrate of iron in 2 fl. ʒ of water; add 1 pint of *wine of orange;* mix and filter.†

Bitter Wine of Iron.—Dissolve 128 grains of soluble citrate of iron and quinia in 2 fl. ʒ of water; add 1 pint of *wine of orange;* mix and filter.

Wine of Wild Cherry Bark.—Mix together 1 fl. oz. of fluid extract of wild cherry bark, 2 fluid oz. of syrup of wild cherry bark, 10 minims of solution of oil of bitter almond, and 13 fl. oz. of *wine of orange.* Allow to stand several days, if convenient, and filter.

Wine of Wild Cherry Bark and Pyrophosphate of Iron.—Soften 128 grains of pyrophosphate of iron in 2 fl. ʒ of water; add 1 pint of *wine of wild cherry bark;* mix and filter.

The Bismuth Ores of Bolivia, Peru, and Chili.

BOLIVIA is, according to Y. Doneyko, the richest of all the countries in bismuth. The ores are usually associated with tin-stone, and sometimes with silver and gold. The quantities of bismuth found in Peru and Chili are comparatively small.

The bismuth ores of Bolivia consist of sulphides, oxides, and metallic ores.

1. SULPHUR-ORES.—*Bolivite,* Bi_2S_3, Bi_2O_3, apparently rhombic, found at Tazna.—*Bismuth-glance* occurs chiefly at Chorolque, near Tazna.—*Bismuth-copper sulphide:* from the mines of Cerroblanco, in the Chilian province of Atacama.—*Bismuth-silver sulphide:* found by Pflücker in the Santa Matilda de Morocochu mine in Peru.

2. OXIDES.—*Taznite.* Chlorarsenate and chlorantimonate of bismuth: occurs at the outcrop of the veins.—*Bismuth Hydroxide.* Compact and earthy, the most abundant of the Bolivian bismuth ores.—*Hydrated Bismuth Silicate:* accompanies the bismuth-glance of Chorolque.

3. METALLIC ORES.—*Native Bismuth:* Of rather frequent occurrence in Bolivia; found together with oxysulphide at Tazna; contains no tellurium. In other localities it is associated with gold, telluric bismuth, and bismuth-silver.—*Annales des Mines* [7], 18, 538.

* This elixir was first prepared by me at the request of a gentleman who had habitually used the *chloral hydrate* since its introduction here, and he finds that the chloral dissolved in this way retains its virtue most completely during the period required for the consumption of one quart. For this reason I have given the formula for its preparation, thinking that if such a preparation is desirable, this seems to serve the purpose.—C. L. D.

† [Dr. Francis Edmund Austin, of London, expressed an opinion which is probably quite near the truth, that the element of wine of iron that is of any particular value is the wine.—ED. N. R.]

Contributions to the Assay of Cinchona.

BY C. PROLLIUS, OF HANNOVER, GERMANY.

THE action of calcium hydrate in the assay of cinchona barks, which consists in the liberation of the alkaloids and the fixation of the coloring matter, may be much more rapidly and completely obtained by mixing the solvent with a certain amount of ammonia, and afterwards decolorizing with lime.

If a mixture of 38 parts of alcohol, 10 parts of chloroform and 2 parts of water of ammonia is shaken with 5 parts of powdered cinchona bark in a closed flask, a wine-red solution is soon produced, which contains the whole of the alkaloids. If this liquid be poured off as completely as possible after a few hours, and then mixed with 5 parts of finely powdered calcium hydrate, it is at once decolorized, while the alkaloids remain in solution. The solution is filtered, weighed, and evaporated, whereupon the quinine will remain as a varnish, the other alkaloids in a crystalline condition, provided the evaporation was conducted slowly. By weighing the liquid before evaporation and comparing it with the total weight of solvent, it will be easy to calculate the proportion of powdered bark to which the evaporated portion corresponds.*

The process becomes still more simple, if it is desired to determine in a bark merely that portion of alkaloids which is quinine, or generally soluble in ether, since a decoloration here becomes unnecessary, and 3 gm. of bark are already sufficient for a good result. A good solvent was found to be: 88 p. of ether, 4 p. of water of ammonia, and 8 p. of alcohol. The last is added merely to facilitate the solution of the water of ammonia in the ether.† If 30 gm. of this mixture be repeatedly shaken with 3 gm. of powdered cinchona bark, during several hours, all ether-soluble alkaloids are dissolved, and, after subsidence of the powder, 20 gm. of the solution, corresponding to 2 gm. of the bark, may be poured off clear. On slightly supersaturating this liquid with dilute sulphuric acid, added in drops, a dense aqueous layer of the alkaloidal salts separates at the bottom, from which the ether may easily be separated. Yet the latter, owing to the alcohol, still retains a trifle of alkaloid, which may be removed by shaking first with 2, then with 1 gm. of water. The aqueous liquids are then freed from alcohol by warming, precipitated, while still warm, by ammonia in a tared capsule, and the residue dried and weighed.—Abstract from *Arch. d. Pharm.*, 1881, Aug.

Cotton-Seed Exports from Smyrna.

COTTON-SEED is exported on a large scale from Smyrna. Shipments average about 250,000,000 pounds nearly all to England. The price is seventy-seven to ninety-five cents per kintal. This quantity includes the seed obtained from the cotton consumed locally, as well as of that exported to Western Europe. It is chiefly used in the manufacture of oil.—*Report of U. S. Consul-General Heap of Constantinople.*

Purification of Carbon Bisulphide.

IN order to free carbon bisulphide from fetid impurities, E. ALLARY agitates it with a concentrated solution of potassium permanganate until the permanence of a violet tint shows that the reducing action has ceased. The carbon bisulphide is then washed with water, separated by a funnel, and finally filtered; the pure ethereal-smelling liquid is then preserved from the action of light. The author finds that the usual method of distillation is in most cases practically useless.—*Bull. Soc. Chim.* [2], 35, 491.

The Production of Shellac in India.

THE lac insect abounds on certain jungle trees in every part of the country; and from time immemorial, it has been collected by the wild tribes, in order to be worked up into lacquered ware. But European enterprise has in vain tried to place the industry upon a stable and remunerative basis. Though lac is to be found everywhere, foreign exportation is almost entirely confined to Calcutta, which draws its supplies from the hills of Chutiá Nágpur, and in a less degree from Assam and Mirzápur, in the north-western provinces. Lac is known to commerce both as a gum (shell-lac) and as a dye. In 1878, the total exports of lac of all kinds were 104,717 cwts., valued at £362,244; in 1879, the total exports were 91,983 cwts, valued at £300,072.

Lac (*lábi*) is a cellular, resinous incrustation of a deep-orange color, secreted by an insect (*Coccus lacca*) round the branches of various trees, chiefly kússúm (*Schleichera trijuga*), palás (*Butea frondosa*), pipal (*Ficus religiosa*), and baer (*Zizyphus Jujuba*). The principal component is resin, forming about 60 or 70 per cent, from which is manufactured the shell-lac of commerce. Lac-dye is obtained from the small cells of the incrustation, and is itself a portion of the body of the female insect. The entire incrustation, while still adhering to the twig, is called stick-lac. In order to obtain the largest quantity of dye, the stick-lac should be gathered before the young come out, which happens twice in the year—in January and July. The dye is first extracted by repeated processes of washing and straining, while the shell-lac is worked up from what remains in a hot and semi-liquid state For all articles in which a fast color is not required, lac-dye can never compete with the cheaper and less prominent aniline dyes; while for most lasting colors, cochineal is preferred. Lac-dye, however, is said to be superior even to cochineal in resisting the action of human perspiration; and it is probable that in the event of the supply of cochineal falling off, lac-dye might be used in its stead to produce the regimental scarlet. It has largely replaced cochineal of late years in dyeing officers' coats, and a further extension of its use for similar purposes seems possible. The chief establishment in India for manufacturing lac is situated near Dorandá, in Lohárdagá district, Chutiá Nágpur, to which stick-lac is brought in from all the countries round as far as the central provinces. The annual out-turn is about 6,000 cwts. of shell-lac, made from double that quantity of raw material. In 1877–78, this factory ceased working, owing to the depressed state of the market in Europe.—*Imper. Gaz. of India*, IV, 510.

To make Rubber-Packing Air and Steam-Tight.

THE packing is brushed over with a solution of powdered rosin in ten times its weight of stronger water of ammonia. At first, this solution is a viscid, sticky mass, which, however, after three to four weeks, becomes thinner and fit for use. The liquid adheres easily to rubber, as well as to wood and metal. It hardens as soon as the ammonia evaporates, and becomes perfectly impervious to liquids.

Turkish Black Hair-Dye.

VERY finely powdered nutgalls are triturated with a fatty oil until a doughy mass results, which is then introduced into an iron vessel, and roasted until no more oily fumes are given off. The residue is now rubbed, with water, to a pulp, heated, and while still moist, mixed with such a quantity of a mixture of equal parts of most finely divided metallic iron and copper that the mass still retains the consistence of an ointment. It is next perfumed with ambergris, and preserved in a damp place, whereby it develops its full power of dyeing. Hair, to which this mixture is

*The small difference arising from the alkaloids contained in solution may be entirely disregarded. Supposing we had a bark known to contain 1 per cent of alkaloids, and we had shaken 5 gm. of this bark with 50 gm. of the above mixture; and, after the many manipulations quoted in the text (taking care that no menstruum is lost by premature evaporation), supposing the filtrate weighed 40 gm., we may, without hesitation, say that the 40 gm. correspond to 4 gm. of bark. In reality, the alkaloids contained in the solution and left on evaporation should be deducted from the 40 gm.: but even in a 3 per cent bark this residue would not weigh more than 0.12 gm., and this would reduce the 40 gm. only to 39.88, a difference which can be entirely disregarded.—ED. N. R.

† Probably, by substituting spirit of ammonia (alcoholic solution of ammonia, 10 per cent), in both processes an advantage would be gained. The author ought to have stated the specific gravity, both of the alcohol and of the ether.—ED. N. R.

applied, retains its softness, plasticity, and black color for a long time after one application. The mixture owes its property to the presence of pyrogallic acid, which is formed on roasting the nutgalls.—M. v. Valta, in *Pharm. Zeit.*, Aug. 24th.

[Original Communication.]

Syrup of Senega, Aromatic Syrup of Rhubarb and the Source of Spruce Gum.

BY PROF. E. L. PATCH, OF BOSTON.

The *officinal Syrup of Senega* having given us much trouble for the past three years, I have used the following with great satisfaction. It yields a clear and permanent syrup.

Senega, No. 30 powder..... 250 parts.

Percolate with a menstruum consisting of dilute alcohol, 1,900 parts and aq. ammon. (960 sp. gr.), 15 parts.

Filter the percolate through absorbent cotton; evaporate to 480 parts; add glycerin, 150 parts, and sugar, 720 parts, and dissolve cold.

Officinal Syr. rhei arom. soon becomes unsightly, and, hence, for some time, I have made it as follows:

Rhubarb, No. 40..... 20 parts.
Cinnamon, No. 40,
Cloves, No. 40 ....āā 4 "
Nutmeg, No. 40 ... ... 2 "

M. Moisten and percolate with this menstruum:

Glycerin, 40 parts; alcohol, 70 parts; water, 120 parts. Continue the percolation with water until 420 parts of percolate are obtained, in which dissolve 610 parts of sugar, *cold*.

In view of the near issue of the *Pharmacopœia*, the above may be out of date.

Spruce Gum. In none of the dispensatories or ordinary books of reference can anything be found in relation to spruce gum. Appleton's Cyclopædia, last edition, states it to be an exudation from the hemlock spruce, *Abies canadensis*. This is manifestly wrong. To settle a dispute engendered by this statement, by referring to authority beyond my own observation, I sent the query to Prof. Gray, of Harvard University. He answered that *Abies canadensis does not* yield spruce gum, and referred my query to another. From the person to whom my query was relegated by him I received the following: "*Abies nigra*, commonly called black or double spruce, is the tree from which such large quantities of gum are taken. *Abies alba* also furnishes gum, but of far less quantity, though much superior in quality."

Subsequently I received from New Hampshire specimens of the bark with adherent gum, and specimens of foliage of the trees furnishing them, which confirmed the above statement.

Tea Cultivation and Manufacture in India.

The processes of cultivation and manufacture are very similar throughout the whole of India, with the exception that in Upper India the leaf is prepared as green tea for the markets of Central Asia. Three main varieties are recognized—*Assam*, *China*, and *Hybrid*. The first is the indigenous plant, sometimes attaining the dimensions of a tree; yielding a strong and high-priced tea, but difficult to rear. The China variety, originally imported from that country, is a short bushy shrub, yielding a comparatively weak tea and a small out-turn per acre. The third variety is a true hybrid, formed by crossing the two other species. It combines the qualities of both in varying proportions, and is the kind most sought after by planters. In all cases, the plant is raised from seed, which in size and appearance resembles the hazel nut. The seeds are sown in carefully prepared nurseries in December and January, and at first require to be kept shaded. About April the seedlings are sufficiently grown to be transplanted—an operation which continues into July. The site selected for a tea garden should be comparatively elevated land, for it is essential that water should not lodge round the roots of the plants. In Assam, which may be taken as the typical tea district, the most favorite situation is the slopes of low hills, that everywhere rise above the marshy valleys. On the summit may be seen the neat bungalow of the planter, lower down the coolie lines, while the tea bushes are studded in rows with mathematical precision all round the sides. The best soil is virgin forest land, rich in the decomposed vegetable matter of ages. Great pains are expended to prevent this fertile mould from being washed away by the violence of the tropical rains. In bringing new land into condition, the jungle should be cut down in December, and burned on the spot in February. The ground is then cleaned by the plough or the hoe, and marked out for the seedling by means of stakes planted at regular intervals of about four feet from each other.

For the first two years nothing is required except keeping the plants clear of weeds. Afterwards, it is necessary to prune the luxuriant height of the bushes in the cold season of every ensuing year. The prunings should be buried around the roots of the plant for manure. The plants begin to come into bearing in the third year, and gradually reach their maximum yield in their tenth year. The produce consists of the flushes or successive shoots of young leaves and buds, which first appear in the beginning of the rainy season. There are from five to seven full flushes in the season from March to November. The bushes are picked about every ten days by women and children, who are paid by weight on bringing their baskets to the factory, when the operation of manufacture forthwith begins. The leaf is first spread out lightly on trays or mats, in order that it may "wither," *i. e.*, become limp and flaccid. Under favorable conditions this result is effected in a single night; but sometimes the natural process has to be accelerated by exposure to the sun or by artificial heat. The next operation is known as "rolling," performed either by the manual labor of coolies or by machinery. The object of this is to twist and compress the leaf into balls, and set up fermentation. The final stage is to arrest fermentation by drying, which may be effected in many ways, usually by the help of machinery. The entire process of manufacture after "withering" does not take more than about four hours and a half. All that now remains to do is to sort the tea in sieves according to size and quality, thus distinguishing the various grades from Flowery Pekoe to Broken Congou, and to pack it for shipment in the well-known tea chests.—*Imper. Gaz. of India*, IV., 504.

Lister's Eucalyptus Gauze.

This new dressing, devised by Lister, is prepared by impregnating gauze-muslin with the following mixture:

Oil of Eucalyptus.....1 part.
Damar ....3 parts.
Paraffin.....3 parts.

The damar and paraffin are melted, the oil is added, and the mixture sprinkled or squirted over the muslin laid together in folds. It is then placed in an air-tight heating apparatus, compressed by weights, and exposed to dry heat. Occasionally it is taken out when cold, refolded, and again heated until it is uniform. The finished gauze contains 10 to 11% of the mixture; five square metres (about six yards of one-yard wide muslin) contain forty grams.

Cosmetic.

The *Pharm. Zeitung.* (1881, No. 68) has the following formula:

White wax..... 50 gm.
Beef tallow..... ..... 100 "
Oil of bergamot..... 6 "
" cassia ..... 16 gtt.
" thyme..... 8 "

A yellow color is produced by tinct. of saffron or tinct. of turmeric, a brown color by burnt umber in oil, and a black color by animal charcoal ground in oil.

Natural Saltpetre.

INDIA has almost a monopoly of the supply of natural saltpetre, upon which Europe largely depends for the manufacture of gunpowder. It occurs with other saline substances as a white efflorescence upon the surface of the soil in many parts of the country, especially in the upper valley of the Ganges. Its preparation leaves common salt as one of the residuary products; and fiscal restraints have accordingly tended to limit the manufacture to the most remunerative region, which is found in North Behar. The manufacture is simple, and entirely in the hands of a special caste of natives, called Nuniyás, who are conspicuous for their capacity of enduring hard work. As is the case with most Indian industries, they work under a system of money advances from middle-men, who are themselves sub-contractors under the large houses of business. In former times, the East India Company engaged in the manufacture on its own account, and when it gave up its private trade, the works were taken over by European firms. But these have in their turn retired from the business, which is now in a state of decline (almost killed in Southern India) partly owing to the general fall in price, and partly to the restrictions imposed by the salt preventive department.*

The manufacturing season begins with the cold season in November. The presence of saltpetre in the soil is revealed by efflorescence after a heavy fall of rain. This earth is scraped together, and first placed in a large vessel, through which water is filtered. The brine is then boiled in pots, and crude saltpetre mixed with common salt is the result. The proportion of salt to saltpetre is said to be about one-sixth. The sale of this salt is prohibited under stringent penalties. The crude saltpetre is now handed over to the refiners, who work on a larger scale from the Nuniyás. It is again subjected to a process of boiling in large iron boilers of English manufacture, and is allowed to crystallize gradually in open wooden troughs. In refining, it loses nearly one-half its weight, and is now ready for the market. In 1873, the single district of Tirhut contained 22,528 filters and 305 refineries. The exports of saltpetre from Calcutta are fairly constant, averaging about 450,000 cwt. a year, of which one-half goes to the United Kingdom. More than two-thirds of the total comes from Behar, chiefly from the districts of Tirhut, Sáran, and Champáran, though Patná is the railway station to despatch to Calcutta. Cawnpore, Gházipur, Allahábád, and Benares, in the North-western Provinces, send small quantities, while a little comes from the Punjab.—*Imperial Gaz. of India*, IV., 594.

Effervescent Citrate of Iron (Kossmann).

Ammonio-citrate of iron	8 parts.
Citric acid, in fine powder	75 "
Sugar, in fine powder	75 "
Bicarbonate of sodium	90 "

Reduce the ingredients to powder, dampen them with absolute alcohol, and rub them through a sieve so as to obtain a granular powder. This has a citron-yellow color, is stable (if kept in well-stoppered vials), and strongly effervescent.—*Pharm. Zeit.*, 1881, No. 68.

Indigo Cultivation in India.

INDIGO is one of the oldest, and, until the introduction of tea planting, it ranked as the most important of the Indian staples grown by European capital. In Bengal proper, its cultivation had greatly declined since the early years of this century. English planters have entirely abandoned the districts of Húglí, the twenty-four Parganás, Dacca, Faridpur, Rangpur, and Pabná, which are dotted with the sites of ruined factories. In Nadiyá, Jessor, Murshidábád, and Maldah, the industry is still carried on; but it has not recovered from the depression and actual damage caused by the indigo riots of 1860, and the emancipation of the peasantry by the land act of 1859. Indigo of a superior quality is manufactured in Midnapur, along the frontier of the hill tracts. The cultivation on the old scale still flourishes in North Behar, from which is derived one-half of the total exports from Calcutta. No accurate statistics of area are available; but in Tirhut alone, there are 56 principal concerns, with 70 outworks, producing annually about 20,000 *maunds* of dye; in Sáran, 30 principal concerns and 25 outworks, producing about 12 000 *maunds*.*

It has been estimated that the total amount of money annually distributed by the planters of North Behar cannot be less than one million sterling. Across the border, in the north-western provinces, indigo is grown and manufactured to a considerable extent by native cultivators. In the Punjab, also, indigo is an important native crop, especially in the districts of Múltán, Muzaffargarh, and Dera Ghází Khán. In Madras, the total area under indigo is about 30,000 acres, grown and manufactured entirely by the natives, chiefly in the north-east of the Presidency, extending along the coast from Kistna to South Arcot, and inland to Karnúl and Cuddapah. In 1877-78, the total export of indigo from all India was 120,605 cwts., valued at £3,494 334; in 1878-79, the export amounted to 105,051 cwts., of the value of £2,960,463.

In Bengal indigo is usually grown on low-lying lands, with sandy soil, that are liable to annual inundation; in Behar, on comparatively high land. The general practice is for the planter to obtain from the *zamínddr* or landlord, a lease of the whole village area for a term of years; and then to require the ráyats or cultivators to grow indigo on a certain portion of their farms every year, under a system of advances. The seed, of which the best kind is imported from Cawnpore, is generally sown about March; and the crop is ready for gathering by the beginning of July. A second crop is sometimes obtained in September. When cut, the leaves are taken to the factory, to be steeped in large vats for about ten hours until the process of fermentation is completed. The water is then run off into a second vat, and subjected to a brisk beating, the effect of which is to separate the particles of dye and cause them to settle at the bottom. Finally, the sediment is boiled, strained, and made into cakes for the Calcutta market. In recent years, steam has been introduced into the factories for two purposes: to maintain an equable temperature in the vats while the preliminary process of fermentation is going on, and to supersede by machinery the manual labor of beating.—*Imper. Gaz. of Ind.*, IV., 495.

Detection of Oil of Pennyroyal in Oil of Peppermint.

THE following card has been circulated by *J. J. Quetting & Co.*, of New York:

"Since we find much oil peppermint in the market adulterated with oil pennyroyal, we give the following test, which we have found correct:

"Take one drachm chloral hydrate and half a drachm C. P. sulph. acid; mix together in a glass mortar, add a few drops of alcohol, and stir until it becomes clear. Then use this mixture in equal proportions with the suspected oil in a small porcelain dish, and mix thoroughly together. The result is a fine cherry color, if the oil is pure; otherwise, if adulterated with pennyroyal, it turns a dark olive green, more or less as to quantity of adulteration."

Fine Drilling.—Professor Edward C. Pickering, of Harvard College, says that, in undertaking to measure the intensity of the light of the satellites of Mars, he had occasion to need an extremely small hole. Among the artisans who essayed to furnish what was required was one who had succeeded in making a hole edgewise through an old-fashioned three-cent piece, and another who had pierced a needle through from end to end. A hole about the *twenty-five hundredth* part of an inch in diameter was finally secured.

* The duty on salt throughout India is about 7 shill. per cwt. The income from this source is the next largest after the land revenue.

* The factory *maund* of indigo weighs 74 lbs. 10 oz.

NEW REMEDIES.

AN ILLUSTRATED MONTHLY TRADE JOURNAL OF

MATERIA MEDICA, PHARMACY, AND THERAPEUTICS

VOL. XI., NO. 1. WHOLE NO. 91.

FRED'K A. CASTLE, M.D., - - EDITOR.
CHARLES RICE, PH.D., - ASSOCIATE EDITOR.

PUBLISHED BY

WILLIAM WOOD & CO., No. 27 Great Jones St., N. Y.

JANUARY, 1882.

SUBSCRIPTION PRICE, per year, - - - - - $2.00
SINGLE COPIES, - - - - - - - - - - .20

Address all communications relating to the **business** of NEW REMEDIES, such as subscriptions, advertisements, change of Post-Office address, etc., to WILLIAM WOOD & Co., 27 Great Jones St., New York City, to whose order all postal money orders and checks should be made payable. Communications intended for the **Editor** should be addressed to THE EDITOR OF NEW REMEDIES, in care of William Wood & Co., 27 Great Jones St., New York City.

NEW REMEDIES is issued the 25th of each month, dated for the month ahead. Changes of advertisements should reach us before the 10th. New advertisements can occasionally be inserted after the 18th.

REGULAR ADVERTISEMENTS according to size, location and time. Special rates on application.

ELECTROTYPES of the illustrations contained in NEW REMEDIES will be furnished for 50c. per square inch.

EDITORIAL

COMMENCING with this number, brevier type alone (instead of long primer and brevier) will be used for the text of NEW REMEDIES, thus enabling us to increase the amount of matter, equivalent to about four pages of brevier. Coincident with this change, the printer furnishes us with an entirely new outfit of type.

THE Tariff Convention held in this city during the last week of November did not accomplish as much as was expected in the matter of memorializing Congress on the subjects chiefly interesting the drug and chemical trade. The repeal of the revenue-stamp act, as applied to medicines and perfumery, and the revision of the tariff on important manufactured drugs, essences, essential oils, spirits, etc., and on the crude materials used in their manufacture, received some attention, but far less than their importance demanded. It is announced that the official report of the proceedings will be published next month, and will contain a number of papers which were not read, owing to the want of time. It is hoped that the report will also embrace statistical statements relating to the industries concerned, which will prove more practically valuable than the detached papers presented.

AT a meeting of the Proprietary Medicine Manufacturers' and Dealers' Association, lately held in this city, Dr. F. Humphreys made some interesting statements respecting this business, which we quote from the *Oil and Drug News*. While the tax on proprietary medicines is four per cent to the consumer, it is nearly ten per cent to the manufacturer. It pays the Government annually about $1,836,000, and for twenty years has paid $36,000,000, which far exceeds the combined savings of all engaged in the business. This industry also pays a spirit tax of $1.80 per gallon, or more than $70.00 per barrel. A pharmacy using two barrels a month pays annually a tax of about $2,000, while one consuming two barrels a week pays about $9,000. Corks, glass, and medicines are also taxed. Of three thousand medicines now in the hands of extensive dealers, not more, probably, than twenty, certainly not more than forty, could be run as a separate business. The rest are made to supply a limited demand.

THE first report of the Board of Pharmacy for West Virginia, organized under the law recently passed shows the following statistics: There are three hundred and fourteen registered pharmacists in the State, all the counties being represented but Logan, McDowell, Pendleton, Pocahontas, Wayne, and Wyoming. One hundred and eighteen towns and cities have registered pharmacists, a large proportion of them having registered by virtue of the provision of the Act allowing all engaged in business at the time of its enactment to register without examination. About sixty-five per cent of those examined were passed. It is urged that an amendment of the law is needed to regulate the sale of deadly poisons by country store-keepers, and vending them from vessels such as are customarily used for articles of food.

The revenue from examination has not been sufficient to cover the expense of a proper enforcement of the law. A note for Mr. Edmund Bocking, the Commissioner of Pharmacy, states that only six graduates in pharmacy have yet

been registered, and that one of these has since left the State.

WEST VIRGINIA seems to be especially afflicted with trouble in the regulation of pharmaceutical practice. We have lately received from the State Pharmaceutical Association an abstract of an act, drafted by a committee of the last Legislature, which is to be offered for adoption this month, and which is likely to be so obnoxious to the pharmacists of the State, if it becomes a law, that strenuous efforts should be made to secure its defeat. The following are some of its features: A license to sell liquor is required for the sale of spirituous, vinous, or malt liquors, or *any intoxicating liquor, drink, mixture, or preparation whatever, or to carry on the business of a druggist*, under a penalty of $25.00. Without such license, the keeper of a hotel or tavern is to be fined $10.00. A State license is also required of keepers for public use of bowling alleys, billiard tables, bagatelle tables, or tables of like kind; of the exhibitors of circuses, menageries, theatrical performances, or public shows, to which admission is purchased; of hawkers, peddlers, auctioneers, brokers, private bankers, exchangers of moneys or funds, attorneys, *physicians, dentists*, daguerrotypists, pawnbrokers, dealers in patent rights, and of all *who sell goods by sample*. The penalty for infringement of this section is from ten to one hundred dollars.

The circuit court of every county is to appoint, from time to time, three physicians, to constitute a board of examiners for those who wish a license to carry on the business of a druggist.

No druggist will be allowed to sell for medicinal use any intoxicating mixture, drink, or beverage except upon a prescription, worded as follows:

"To A——— B———, Druggist: Let D——— have (state the quantity actually necessary) of ——— (state the kind of liquor, drink, mixture, or preparation required) for medicinal purposes. And I hereby certify, on my professional honor, that the liquor (drink, mixture, or preparation, as the case may be) herein prescribed, is absolutely necessary for the said C——— D——— as a medicine, and not as a beverage, and that it is not my purpose that it shall be used otherwise than as a medicine.

"Given under my hand this —— day of ——,

E——— F———, M.D."

We have not space to give further details of this legislative curiosity, but will say that some of its provisions are contrary to the laws of the general Government, as decided by United States Courts; and that most of the others will do more harm than good in any community where this enforcement might be attempted.

BIBLIOGRAPHY.

SUPPRESSION OF URINE: Clinical Descriptions and Analysis of Symptoms. By E. P. FOWLER, M.D. Ninety-three Clinical Cases, with Illustrations, Tables, and Diagrams. New York: William Wood & Co., 1881, pp. 86, 8vo.

THE work opens with a case seen by the author, which is followed by brief tabular notes of ninety-three cases of suppression from various causes, such as Simple Calculus, Calculus and Calculi with Previous Destruction of One Kidney, Cystic Degeneration of Kidneys, Obstruction of Renal Artery, Renal Abscess—Previous Destruction of One Kidney, *Anuria*—Mechanical Results of Scirrhus, Result of Scarlet Fever, following Measles; Caused by Cholera; Associated with Hysteria; Associated with "Spinal Irritation;" from Calomel; Associated with Poisoning by Bichloride of Mercury, etc. The subsequent sections (4) are devoted to a discussion of the various questions connected with the subject. The whole is a valuable addition to medical literature.

THE NURSE AND MOTHER: A Manual for the Guidance of Monthly Nurses and Mothers; comprising Instructions in regard to Pregnancy and Preparation for Childbirth; with Minute Directions as to Care during Confinement, and for the Management and Feeding of Infants. By WALTER COLES, M.D., Consulting Physician to St. Ann's Lying-in Asylum, etc. St. Louis: J. H. Chambers & Co., 1881, pp. 153, 8vo.

THIS book appears to be all that is claimed in its title, and may be taken as a very reliable, popular guide to those chiefly concerned.

ANNUAL REPORT OF THE SURGEON-GENERAL OF THE U. S. ARMY FOR 1880–81.

THE value of medical and hospital supplies issued during the preceding fiscal year was $183,253.42. The work on Vol. II. of the Medical and Surgical History of the War of the Rebellion embraced 110 drawings on wood, 96 engravings, 4 lithographic plates, and the completion of 152 pages of the volume; bringing the total number of its pages to 534. Nearly 2,500 volumes and 3,200 pamphlets were added to the library, making the totals of about 54,000 volumes and 62,000 pamphlets. The manuscript for Vol. III. of the Index Catalogue is now going to press. The necessity for a fire-proof building for the museum and library is again urged.

MANUAL FOR THE PHYSIOLOGICAL LABORATORY. By VINCENT HARRIS, M.D. (Lond.), M.R.C.P., and D'ARCY POWER, B.A. Cantab. New York: William Wood & Co., 1881, pp. 142, 8vo.

THE student of histology and physiology will find in this volume a very complete and detailed guide to the examination and study of blood, epithelium, endothelium, connective tissues, cartilage, bone, muscles, nerve tissues, blood-vessels, alimentary canal and its glandular apparatus, trachea and lung, skin and appendages, genito-urinary organs, lymphatics, organs of special sense, teeth, mammary gland, ductless glands, and, under the head of Physiological Chemistry, the native albumins, derived albumins, globulins, fibrin, and peptones.

FROZEN SECTIONS OF A CHILD. By THOMAS DWIGHT, M.D., Instructor in Topographical Anatomy and Histology in Harvard University, etc. Fifteen Drawings from Nature, by H. P. Quincy, M.D. New York: William Wood & Co., 1881, pp. 66, 4to.

THIS series of plates is one of the most important of recent additions to topographical anatomy. They are made from sections of the neck, thorax, abdomen, and pelvis of a female child said to be three years old, and show, with great faithfulness, the relations of the organs and viscera. Quite as valuable are the pages of explanatory text, in which the reader will find many facts not met with in other works on the subject, and extremely valuable to all who

have occasion to treat the diseases of children. It may safely be said that no anatomist can afford to be without this unique work.

LECTURES ON ELECTRICITY (Dynamic and Franklinic): in its Relations to Medicine and Surgery. By A. D. ROCKWELL, A.M., M.D. New York: William Wood & Co., 1881, pp. 122, 8vo.

THIS is practically a second edition of a manual issued a few months since, to which matter has been added relative to Franklinism or static electricity, the "galvanic accumulator" or the new means proposed by Trouve for storing galvanism, and the induction balance—an instrument of considerable promise as an aid in diagnosis.

LECTURES ON DIGESTION: an Introduction to the Clinical Study of Diseases of the Digestive Organs. By DR. C. A. EWALD. Translated by ROBERT SAUNDBY, M.D. Edin. New York: William Wood & Co., 1881, pp. 149, 8vo.

THIS work relates particularly to the ultimate chemical and vital processes connected with the digestive function, as determined by recent observations. Owing to the intricacies of the subject, the discursive style of the writer and the retention in the translation of Teutonic forms of expression, the book cannot be said to furnish light reading, but no one who desires familiarity with the subject can afford to be ignorant of its contents.

PROCEEDINGS OF THE NORTH CAROLINA PHARMACEUTICAL ASSOCIATION AT ITS SECOND ANNUAL MEETING. Held at Newbern, Aug. 9th and 10th, 1881. Also Constitution and By-laws.

THE report of this meeting has already appeared in our columns. The officially-published proceedings, now at hand, show a thriving state of pharmaceutical affairs in the State.

DIE PFLANZENSTOFFE in chemischer, physiologischer, pharmakologischer und toxicologischer Hinsicht. Für Aerzte, Apotheker, Chemiker und Pharmakologen bearbeitet von DR. AUG. HUSEMANN, *weil.* Prof. d. Chemie an der Kantonschule zur Chur, DR. A. HILGER, o. ö. Prof. an der Universität Erlangen, und DR. THEOD. HUSEMANN, Prof. der Medicin an d. Univ. Göttingen. *Zweite völlig umgearbeitete Auflage.* In 2 Bänden. Erste Lieferung (vol. 1, first half), 8vo, Berlin, 1882: Julius Springer, pp. 320 ($2.20).

[THE PROXIMATE PRINCIPLES OF PLANTS, in their chemical, physiological, pharmacological, and toxicological relations; for Physicians, Pharmacists, Chemists, and Pharmacologists. By DR. AUG. HUSEMANN, late Professor of Chemistry at the Cantonal School of Chur; DR. A. HILGER, Professor at the University of Erlangen, and DR. THEOD. HUSEMANN, Professor of Medicine at the University of Göttingen, etc.].

IT affords us a great pleasure to announce the appearance of a new and revised edition of this important work which has been out of print for several years. Since its first edition, one of the editors, Dr. August Husemann, has been removed from his sphere of usefulness by death, and it was no small task for his surviving brother to prepare for a new edition. He has, however, succeeded in associating with himself Prof. Hilger, of Erlangen, who has performed his share of the work with consummate ability, to judge from the portion of the work so far published.

It was not intended merely to revise the work and complete it to date, but it was decided to alter its whole interior arrangement. The first edition contained the proximate principles classified as alkaloids, organic acids, neutral principles, complex organic bodies. The present edition contains all proximate principles which are not universally distributed through the vegetable kingdom, classified according to the natural families, whereby the relationship of the latter is often brought out more prominently. This arrangement also gives to the work more the character of a phytochemical history.

The great extent of chemical and pharmacological investigations of proximate principles, during the last ten years, has undoubtedly been in great part due to the publication of the first edition of this work which united, in a conspicuous and systematic manner, the results of previous investigations on this field. The present edition, of course, comprises what has been accomplished since.

The following synopsis of the first half of the first volume will give a good account of the arrangement of the text:

I. On Proximate Principles in general.

A. Chemical processes in the vegetable organism.

Origin of organic substances, pp. 3, 11.

B. Chemical characteristic of proximate principles, pp. 12–72. Carbohydrates.—Glucosides.—Bitter Principles and Coloring Matters.—Tannins.—Pectin-Bodies.—Organic Acids.—Alkaloids.—Fats (Wax).—Volatile Oils.—Camphor.—Resins (and Balsams).—Proteïn-Bodies.

C. Effects and Uses of the Vegetable Principles (pp. 73–99).

II. The Proximate Principles (special part).

A. Principles of universal occurrence.

1. Inorganic constituents of the plant.
2. Carbohydrates: A. Cellulose-group.—B. Glucose group.—C. Cane-sugar group, etc.
3. Organic acids of common occurrence.
4. Albuminoids (proteïn-bodies).
5. Unformed ferments.
6. Coloring matters.
7. Amido-compounds.

B. Principles of circumscribed occurrence.

From this point the principles are arranged according to the botanical classification of natural families. Eichler's system of classification, which is gradually becoming familiarized in Germany, has been adopted.

We shall have frequent occasion to refer to the work, and so will a large number of our readers, many of whom have been long waiting for the new issue. The authors expect to complete the whole work (to be issued in 4 parts) about the middle of next year.*

THE CHEMISTS' AND DRUGGISTS' DIARY, 1882. London: Published for the Proprietors, 44 A Cannon st., E. C.

THIS handy book is always compiled with skill, and usually adapted to the needs of pharmacists outside of Great Britain. Besides the matter which specially concerns British readers, one of the most important features of the text is a synopsis of the strength of preparations of potent drugs in the pharmacopœias now in force (something over twenty) filling six three-column pages. An article on the "Auxiliary Trades for the Chemist and Druggist" furnishes suggestions that may enable some to extend their business and increase their revenue. The whole, with advertisements, fills 138 pages.

DIE QUALITATIVE UND QUANTITATIVE ANALYSE VON PFLANZEN UND PFLANZENTHEILEN. Bearbeitet von Dr. GEORGE DRAGENDORFF, o. Prof. der Pharmacie an der Universität Dorpat. Mit eingedruckten Holzschnitten und einer lithograph. Tafel. 8vo. Göttingen (Vandenhoeck & Ruprecht), 1882.

[The Qualitative and Quantitative Analysis of Plants and Plant-Parts. By Dr. George Dragendorff, Professor of Pharmacy at the University of Dorpat. With woodcuts and a lithographic plate, etc.]

THIS work has come to our hands just before going to press, and we have no time to do more than to draw attention to it at present. Those of our readers who are interested in plant analysis will thank us for doing so.

We can make no attempt at present to review the work, as it undoubtedly deserves more than a passing notice. Only one feature will we mention here, which has struck us as eminently practical. This is a list of all hitherto analyzed proximate principles, arranged according to the

* The work may be ordered from Gustav E. Stechert, 765 Broadway, or B. Westermann & Co., 838 Broadway, New York. Price 6 marks per part.

number of carbon-atoms of their formula. Accordingly, after making an ultimate analysis, and having calculated the results, an inspection of the table will frequently assist in the identification of the substance analyzed.

VORZUGS-PREISE der Dampf-Fabrik Aetherischer Oele und Essenzen von *E. Sachsse & Co.*

VERSUCHE UEBER DIE DARSTELLUNG UND CONSTITUTION des Colchicins und über die Beziehungen desselben zum Colchiceïn und einigen anderen Zersetzungsproducten. Von Provisor JOHANN HERTEL. Reprint from the *Pharm. Zeitsch. f. Russl.*, and received from Prof. Dr. G. Dragendorff.

UNTERSUCHUNG DES SOG. FUCUS AMYLACEUS. Vorträge gehalten in der Sitzung der Dorpater Naturforscher-Gesellschaft. Von Apoth. GREENISH. (Received from Prof. Dr. G. Dragendorff.)

CATALOGUE OF PLANTS in Koishikawa Botanical Garden (Japan). 10th Year of Meiji (1877). Published by Scientific Department. Tokio Daigaku. (University of Tokio).

A SYSTEMATIC catalogue, containing the different natural orders, with genera and species, each with its scientific Latin name, and the Chinese and the Japanese equivalents.

DIE VERHÆLTNISSE DER PHARMACIE IN DER SCHWEIZ. Statistik u. erläuternder Bericht nebst Vorschlägen über Reform des Schweiz. Apothekerwesens.—Bearbeitet von der 1879 durch den schweiz. Apothekerverein eingesetzten Commission. (*L. Baillet*, Neuenberg; *J. Brun*, Genf; *A. Huber*, Basel; *Chr. Müller*, Bern; *Ed. Schaer*, Zürich; *C. W. Stein*, St. Gallen; *F. Weber*, Zürich. May, 1881.)

CONTAINS a statistical account, accompanied with tables, of 1. The Exercise of the Pharmaceutical Profession (qualification, legal status, transfer of business). 2. Swiss Pharmacopœia; Table of Maximum Doses; List of Poisons (Legal Recognition in the different Cantons of the "Swiss Pharmacopœia," published by the Swiss Phar. Assoc.). 3. Limitation of Pharmacies; Governmental Supervision; Medicine—Taxes (that is, "officinal limit of the price which may be charged for medicines"). 4. Regulation of Sale of Medicines; Dispensing of Medicines by Physicians. 5. Regulation of the Sale of Poisons. 6. Foreign Assistants; Responsibility of Employés; Apprenticeship.

TRADE NOTES.

A New Test-Paper for Distinguishing Mineral Acids from Organic Acids.—The want of a sure and quick test to show whether an organic acid (acetic, citric, tartaric acid, etc.) is free from mineral acids or not, has long been felt. Up to the present time so simple a test has not been generally known. This want is being remedied by the firm of TOCH, GROTHE & CO., 59 and 61 Goerck street, N. Y., who now introduce to the trade A VIOLET-COLORED TEST-PAPER, the color of which is immediately changed when coming in contact with a mineral acid to a *green or bright yellow*, according to the concentration of the acid, whereas the violet color remains unchanged when in contact with pure organic acids. A pure acetic acid will, for instance, show no reaction, but if sulphuric acid is present, the same will change the violet color into green. This test-paper is sold in packages of 100 sheets of 2 in. square at $1.00 a package.

Dialysates of Alkaloidal Drugs.—MESSRS. MCINTYRE & EMBUY, of 99 North Moore street, N. Y., are meeting with much encouragement in their efforts to introduce this new class of pharmaceutieal preparations. As already explained in a previous number, they are prepared from the crude drug by the process of dialysis, whereby the definite, proximate principles are almost entirely separated from most of the other inert and interfering substances. Another advantage connected with them is this, that they are maintained at a uniform strength, based upon the ascertained average alkaloidal strength of good specimens of the drug. This uniformity is insured by a system of assays, one of which is used to check the other. The list includes only such drugs as contain definite active principles recognizable and precipitable by reagents. A full list of the dialysates will be found elsewhere.

Nearly all of them have been carefully tried in Bellevue Hospital, and up to the present time have been found to produce the peculiar effects of the different drugs in a more rapid manner than has been the case when administering them in most of the other forms.

NOTES, QUERIES AND ANSWERS.

Under this heading we shall, to the best off our ability, endeavor to answer such questions addressed to us, as come within the scope of this journal, provided they are accompanied by the name and address of the writer Answers to queries received after the 5th of the month will lie over until the next issue. Unless special instructions to the contrary accompany the query, the initials of the correspondent will be quoted at the head of each answer.

When asking for the formula of an unusual, patented, or proprietary compound, always accompany the query with any information you may already possess regarding the locality in which it is used, its use and reputed effects, in order to enable us to make inquiry without waste of time and labor. When it can conveniently be done, send also a specimen of the label used on packages of the compound

No. 971.—**Pioscope** (U. D.).

This name has been given by Fr. Heeren, of Hanover, Germany, to a small apparatus for examining the number of fat-globules in the milk. It is derived from *πίων* (pion) *fat*, and *ὁκοπεῖν to examine*. It consists of a round disc of hard rubber, which has in its middle a flat elevation of of 2 *cm.* in diameter, and a rim of only 0.33 *mm.* in height. On bringing a few drops of milk upon this spot, and covering it with a glass cover accompanying the apparatus, the layer of milk (0.33 *mm.* in height) will make the background of the black rubber so much the more obscure the denser it is, that is, the more fat-globules it contains. The tints are various shades of dark bluish-gray. Upon the edge of the glass plate six of these colors are affixed, corresponding in succession to: 1, cream; 2, very fat; 3, normal; 4, not much fat; 5, meagre; 6, very meagre. By comparing the tint of the sample with the standard tints, the relative value of the milk may be ascertained. It is made by the Rubber Comb Company of Hanover, and costs 1 mark.—This apparatus may do for private persons, in their control of the milk which they purchase for their own use. It would, of course, not be reliable enough for basing upon it charges of fraud.

No. 972.—**Cements** (Junior).

Excellent cements may be prepared from some of the constituents of milk, particularly casein. The following are good formulæ for preparing some of them:

Parabolic Cement.—This is a variety of casein or cheese cement prepared as follows: Curdle skim-milk with rennet or vinegar, press out the whey, and dry the curd by a very gentle heat, but as quickly as possible. When quite dry, grind it in a pepper or coffee mill, and triturate it in a mortar until reduced to a very fine powder. Mix ten parts, by weight, of this powder with one part of quicklime, also in very fine powder, and to every ounce of the

mixture add five or six grains of camphor. Triturate the whole well together, and keep in vials well corked.

Used to unite glass, earthenware, etc., which it does very strongly. It is made into a paste, with a little water, as wanted, and applied immediately.

Milk Cement.—This cement is not so generally known as it ought to be. It is the simplest and best domestic cement for repairing china and crockery. The process consists simply in tying the parts firmly together, and boiling them in skim-milk. The tying together of the pieces of a round cup or bowl is not a very simple matter, but it can be done by going the right way to work. First, arrange the parts in their proper positions, and, if a a bowl, set it mouth down, as the pieces will keep their arrangement best in this position. Then wind stout tape round the article, so as to hold the pieces together. Tape is far better than twine, and some pieces should be kept for that purpose. It is easy to draw the tape tight until we come to tie the ends, and then special devices must be used. When sufficient tape has been wound round the article, let one person hold it from slipping, by pressing a finger firmly on each end, and then let another person tie the ends in a firm knot, but leaving the tape so loose from the article that a pencil or stout skewer may be passed under it. Then by twisting the skewer, the tape is tightened in the same way that a surgeon compresses an artery with his tourniquet, and by passing the fingers over the tape, and smoothing it forward toward the ends, all the pieces may be pressed together with a firmness that cannot be obtained in any other way. The article should now be placed in a pan of cold milk (skim-milk is the best and cheapest), which should be gradually heated to the boiling point, and kept at this temperature for some time—say half an hour to an hour—care being taken not to allow it to burn. The articles are allowed to cool in the milk, and when taken out are wiped dry and allowed to stand for a day or two until the cement has become quite hard. They may then be washed off with warm water, and the parts will be found to be strongly cemented together. The same milk may be used again, but not with such good effect. Generally, however, it is possible to pack quite a number of articles in the pan in the first place, especially if they can be *nested* or placed one within the other.

No. 973.—**Alum-Resin** (M. & Co.).

We have never seen this name before, nor have we been able to find any one who could give us information. We have, however, some time ago learned of a new compound of *alumina* and *palmitic acid*, which is decribed as a resin-like body of remarkable properties, and it is highly probable that it is this substance which has been recommended to our correspondent, and regarding which he asks for information.

The substance in question is described as a resinous mass, melting at a higher temperature than damar or copal, easily soluble in oil of turpentine, and in benzin. A solution containing one part of the "aluminium palmitate" (as it is called) in five parts of one of these solvents, is still quite viscid. If applied to paper, this varnish does not strike through, does not become brittle, but remains flexible, dries rapidly, and, though it feels sticky some time after being applied, loses this stickiness when dry. The varnish has a fine silky lustre, and bears admixture with damar and copal, which impart to it a more intense gloss without rendering it brittle.

This substance is likely to be of great usefulness in the manufacture of wall-papers, for cloth printers, varnish makers, and for the preparation of water-tight material, since it is absolutely proof against water.

You will be able to obtain more detailed information by applying to some patent-agency.

No. 974.—**Elixir of Pancreatin** (A. C. N.).

The following formula has been recommended:

Pancreatin	300 grs.
Bicarbonate of sodium	40 grs.
Water	4 fl. oz.
Simple elixir	q. s. ad 32 fl. oz.

Macerate the pancreatin in the water for twenty-four hours; then add the bicarbonate of sodium and triturate until it is dissolved, gradually adding the elixir. Finally filter.

No. 975.—**Cresylic Ointment** (A. M. B.).

If you cannot obtain pure cresylic acid or cresol, you may use instead of it the so-called "crude carbolic acid," which is used commonly as a disinfectant. That which is sold as No. 4 by the New York Coal Tar Chemical Company contains a large amount of cresol, and is highly effective. For making an ointment to be applied to cattle, sheep, etc., you can use any kind of fat or grease available at your place, and mix with it about 2 or 3 per cent of the above liquid. Care must be used that none of it come in contact, in its undiluted state, with the skin, as it is a powerful caustic.

No. 976.—**Baking Powder** (P. & R.).

Good baking powder should contain nothing but a harmless organic acid, an alkaline carbonate or bicarbonate, with or without a phosphate, and some starchy or farinaceous substance as a diluent. The proportions of acid and carbonate should be so arranged that the latter is not in excess. A great excess of acid is likewise to be avoided. The proper proportions to prepare a neutral compound are:

$2NaHCO_3$	and	$C_4H_6O_6$
Bicarbonate of sodium		Tartaric acid
168		150

By using 15 parts of tartaric acid to 16 parts of the bicarbonate, a good result will be obtained. The mixture may be made as follows:

Take 15 lbs. of tartaric acid, in powder, and dry it thoroughly. Also take 16 lbs. of bicarbonate of soda and 16 lbs. of starch or farina, and dry each separately. Then mix the powders thoroughly, and preserve the mixture in small tin cans, well covered, so as to exclude moist air. The addition of about 2 or 3 lbs. of powdered carbonate of ammonium is also recommended. The latter salt is used more exclusively by confectioners, as it is not so likely to impart a yellowish tinge to the product.

The proportions of acid and alkali may be considerably varied, and for some kinds of flour a larger amount of alkali is useful. Upon the basis of the figures above given, you will be able to work out the problem yourself.

No. 977.—**Ozone** (Subscriber).

Our correspondent sends us the printed circular of a nostrum, which begins as follows:

"OZONE."

"A new Process for Preserving all Perishable Articles, Animal and Vegetable, from Fermentation and Putrefaction, retaining their Odor and Flavor.

"*Ozone.*—Purified air, active state of oxygen.—WEBSTER.

"This preservative is not a liquid, pickle, or any of the old and exploded processes, but is simply and purely *Ozone*, as produced and applied by an entirely new process. Ozone is the antiseptic principle of every substance, and possesses the power to preserve animal and vegetable structures from decay, etc., etc., etc."—

We do not deny the possibility that the proprietor of this nostrum employs an effective preservative agent, capable of accomplishing the alleged results; but that he has succeeded in preparing "purely and simply" ozone, belongs in the category of "utter improbability." Ozone is a peculiar state of oxygen, differing from the latter in being extremely energetic and eager to combine with substances otherwise capable of uniting with oxygen, but many of which would refuse to do so with ordinary oxygen. The latter, when transformed into ozone, becomes condensed in volume and increases in density. A molecule of oxygen is a compound of two atoms, O–O; a molecule of ozone is held to be composed of three atoms (O–O)O, the extra atom being ready at a moment to seize upon some oxidizable substance. No chemist has as yet been able to prepare pure ozone. The utmost which

has been done is to convert only a small fraction of any given bulk of oxygen into ozone. It is, beyond doubt, a most important disinfectant and antiseptic, and many of the natural processes of purification of air and soil are due to it. But to state that "ozone is the antiseptic principle of every substance" is rank nonsense. Moreover, from the known properties of highly dilute ozone, it would seem that in a more concentrated condition it cannot only destroy coloring matter and gases of decomposition, but that it even destroys the substance of organic matter itself.

You may rely upon it, the pretended "ozone" is something altogether different or, at all events, it is not what chemists understand by it.

No. 978.—**Sediment in Fluid Extract of Aconite** (H. J. P.).

This correspondent asks: "When fluid extract of aconite is found to leave a precipitate in the bottle, and dispensed in a slightly turbid condition, does it have any increased strength?"

The inquirer probably meant to say, whether, on shaking up the deposited precipitate with the supernatant clear liquid, the resulting turbid mixture would contain more of the active ingredient than if the sediment was allowed to remain undisturbed. This question does not permit a categorical answer—yes, or no—because a great deal depends on the nature of the sediment, and this, in turn, depends on the nature of the menstruum. Aconite is usually extracted by means of stronger alcohol, which is perfectly capable of dissolving, and retaining in solution the alkaloid. The presence of a small quantity of glycerin, which is used in connection with alcohol by some makers, will not interfere with the solubility of the alkaloid either. But it must be remembered that aconite root contains mannite, and some other sugars, which are very apt to be at least partly extracted along with other constituents, during the process of percolation, and which exhibit a tendency to separate again from the fluid on standing, particularly when its equilibrium has once been disturbed by sudden changes of temperature. We are inclined to believe that the sediment in the fluid extract you speak of consists mainly of sugar, but we cannot be sure of this. However, you can easily ascertain whether the sediment contains an alkaloid, by collecting some of it on a filter, washing with just enough cold alcohol to displace the retained fluid, then treating it with highly dilute sulphuric acid and testing the resulting liquid with an alkaloid reagent, as, for instance, with "Mayer's solution," a solution of potassium-mercuric iodide, prepared by dissolving 13.546 gm. of mercuric chloride and 49.8 gm. of potassium iodide in 1 liter of distilled water; or, better still, with a solution of phosphomolybdic acid. In either case a precipitate will be produced, which is caused by the presence of an alkaloid; that is, in the given case, aconite. Further, the sediment, deprived of adhering liquid, may be examined for its taste. You will probably find that it is devoid of that peculiar property of aconite to cause a tingling on the tongue.

The preceding remarks are based, naturally, on supposition, as we have not seen the sediment ourselves; but we *have* had occasion to examine sediments in some fluid extract of aconite and have found it devoid of alkaloid. This is, however, not the case with all other drugs. Whenever the menstruum is so constituted that it can extract resinous principles from the drug, and when, at the same time, the solvent power of the alcohol, as regards the resin, is nearly exhausted, or when the evaporated portion is mixed with the reserved portion and a precipitation of resin is thereby started, this precipitation is apt to continue for some time, and it is particularly in these drugs that some of the accompanying alkaloids may be partly precipitated along with the resin.

No. 979.—**Dose of Fluid Extract of Aconite.**

The same inquirer asks: "How large doses of fluid extract of aconite have been prescribed to your personal knowledge?" We do not remember having seen more han two minims administered at a dose. Bu t this does no: prove that an intelligent physician, in certain cases, may not find a much larger dose proper and necessary. It is recorded that three drops of "a saturated tincture of aconite," in one case, have produced alarming symptoms (see *Nat. Dispens.* under "aconitum"). On the other hand, Sachs and Dulk (Handwörterbuch d. praktischen Arzneimittellehre, i., 182) give the dose of the *powder* as 5 to 15 grains (which would correspond to 5–15 minims of the fluid extract), and the dose of the *extract* as 1 to 6 grains (!) twice daily, which latter quantity we consider as *positively dangerous.* At the time when these authors wrote, pharmaceutical extracts were made much more carelessly than now, and were often rendered almost inert by protracted exposure to heat.

No 980.—**Milk of Roses** (J. F. L.).

The following formula, by Piesse, will answer your purpose.

Valentia almonds (blanched)	½ pound.
Rose-water	1 quart.
Alcohol (91%)	¼ pint.
Oil of rose	1 drachm.
White wax,	
Spermaceti,	
Castile soap (white)	each ½ oz.

Shave up the soap, and place it in a vessel that can be heated by steam or water-bath; add to it two or three ounces of rose-water. When the soap is perfectly melted, add the wax and spermaceti, without dividing them more than is necessary to obtain the correct weight: this insures their melting slowly, and allows time for their partial saponification by the fluid soap; occasional stirring is necessary. While this is going on, blanch the almonds, carefully excluding every particle that is in the least way damaged. Now proceed to beat up the almonds in a scrupulously clean mortar, allowing the rose-water to trickle into the mass by degrees. When the emulsion of almonds is thus finished, it is to be strained, *without pressure,* through clean washed muslin (new muslin often contains starch, flour, gum, or dextrin). The previously-formed saponaceous mixture is now to be placed in the mortar, and the ready-formed emulsion carefully and gradually blended with it. As the last of the emulsion is run into the mortar, the alcohol in which the oil of rose has been dissolved, is to take its place, and to be gradually trickled into the other ingredients. A too sudden addition of the spirit frequently coagulates the milk, and causes it to be curdled. As it is, the temperature of the mixture rises, and every means must be taken to keep it down, the constant agitation and cold mortar effecting that object pretty well. Finally, the now formed milk of roses is to be strained.

The almond residue may be washed with a few ounces of fresh rose-water, in order to prevent any loss in bulk to the whole given quantity. The newly formed milk should be placed into a bottle having a tap in it about a quarter of an inch from the bottom. After standing perfectly quiet for twenty-four hours it is fit to bottle. All the above precautions being taken, the milk of roses will keep any time without precipitate or creamy supernatation.

No. 981.—**Brilliantine** (G. R.).

The following is recommended for imparting a gloss to hair:

Spermaceti	2 oz.	
Veal fat	4 oz.	
Castor oil	2 oz.	
Oil of bitter almonds	½ drachm	or less, in about same proportion.
" " bergamot	2 drachms	
" " cloves	1 drachm	

No. 982.—**Bandoline** (G. R.).

We have given several formulæ in our last July number, which we will repeat here:

1. Reduce 1 oz. of the finest-picked tragacanth to a coarse powder, and put it into a wide-mouthed bottle with 1 pint of rose-water. Shake frequently during two or three days; then strain, with gentle pressure, through fine linen or muslin. It may be colored by adding a little cochineal to the rose-water before adding the gum (Beasley).

2. Macerate 1½ drachms of best tragacanth with 7 oz. of water, 3 oz. of proof spirits, and 10 drops of oil of rose for 24 hours, and strain (Redwood).

3. Macerate 6 oz. of tragacanth in 1 gallon of rose-water during 48 hours, until it forms a gelatinous mass, frequently shaking. Then strain through a coarse linen cloth, and allow it to stand for another day or two. Strain it once more, and add ½ drachm of oil of rose.

If gum tragacanth is objected to, the following formula may answer:

4. Macerate ½ oz. of quince seed in 1 pint of rose-water for a few hours, and strain without pressure. Then add 1 oz. of glycerin.

This latter mixture will not keep long without the addition of some alcohol, which will, however, render it turbid.

Iceland moss, agar-agar (or Japanese isinglass) or flax-seed may be used in place of quince seed.

No. 983.—**To Prevent Tragacanth Paste from Souring** (G. R.).

If salicylic acid or alcohol are objectionable (as you state), you may use either an essential oil, as oil of Eucalytus, oil of cloves, etc., or a little chloroform, or some solution of chloral hydrate. If the paste is to be used for technical purposes, it may be preserved by keeping it in air-tight bottles, with the addition of 1 per cent of bisulphide of carbon, the odor of which can be driven off by warming.

Or, some ether may be poured on top of it, the bottle hermetically closed, and, when the paste is wanted, the ether may be poured off, and the paste exposed for a short time to air.

No. 984.—**Laville's Gout Mixture** (Dr. M. H. S.).

The exact composition of this remedy is unknown. It was analyzed by O. Henry, who found it to contain in 1000 parts

Quinia } Cinchonia }	5
Colocynthin	2.5
Calcium salts	4.5
Coloring matters	3
Water	85
Alcohol	100
Port wine	800

The calcium salts and coloring matter may be disregarded as accidental constituents. The mixture is evidently made by dissolving the alkaloids in the Port wine and adding a tincture of colocynth. As the latter is not officinal here, the (simple) extract of colocynth may be used, and, as colocynth contains about 2 per cent of colocynthin, the following would be about an equivalent working formula:

Quinia sulphate	60 grains
Cinchonia sulphate	45 "
Extract of colocynth	390 "
Dilute alcohol	6 fl. oz.
Port wine, sufficient to make	32 "

No. 985.—**Tooth Cement** (A. H. D.).

"Diamond" Tooth Cement is stated to be prepared by rubbing together equal parts by weight of freshly-burnt powdered quick-lime, and of anhydrous phosphoric acid. The mixture must be made rapidly, and the cavity in the tooth immediately filled with it, before it becomes too moist. The anhydrous phosphoric acid may be prepared at a moment's notice by igniting a small piece of dried phosphorous and letting it burn in a confined space of air, say, on a plate covered with a bell-glass or large beaker. Only about 15 grains of each powder are required at a time.

No. 986.—**Ozone Generator** (R.).

This correspondent asks, what liquid must be used to produce ozone with permanganate of potassium.

The answer is: sulphuric acid. It should be strong, or moderately strong, for this purpose. If phosphorus is to be used at the same time, a more dilute acid will answer, and the phosphorus should be *partly* immersed in the solution. Bichromate of potassium will answer better than the permanganate in this case. On this whole subject compare the article on Ozone and its Solubility in NEW REM., 1879, 361.

ITEMS.

California College of Pharmacy. — The annual commencement exercises of this College were held on Wednesday, Nov. 23d, 1881, at the Grand Opera House, San Francisco. The following is the list of graduates:

J. J. B. Argenti, W. H. Adair, G. R. Chard, N. L. A. Cody, J. M. DeWitt, C. P. Elwert, D. Fletcher, J. P. Fevrier, D. M. Gove, C. H. Mammit, W. F. N. Hurtzig, D. D. Lustig, M. J. Murphy, A. L. Scholl, C. M. Troppman.

Mr. Argenti was presented with the first prize, a gold medal, and Mr. Scholl received the second prize. The third prize, which is open for competition to the junior students, was awarded to Mr. Happelsberger.

The "Pharmacy Act" of Georgia.

WHEREAS, in all civilized countries, it has been found necessary to restrict the traffic in medicines and poisons, and to provide by law for the regulation of the delicate and responsible business of compounding and dispensing the powerful agents used in medicines; and whereas, the safety and welfare of the public are endangered by the sale of poisons by unqualified or ignorant persons; and whereas, the power of physicians to overcome disease depends greatly upon their ability to obtain good and unadulterated drugs and skilfully prepared medicines, and the sophistication and adulterations of drugs and medicines is a species of fraud which should be prevented and suitably punished; therefore,

SECTION 1.—The General Assembly of the State of Georgia do enact: That, within sixty days after the passage of this Act, the Governor of the State shall appoint five experienced druggists or practical pharmacists, who shall have been actively engaged in the drug business within this State for the last three years immediately preceding their appointment, and these five druggists or practical pharmacists, so appointed, shall constitute the Board of Pharmaceutic Examiners, and who shall hold their office for a term of three years, or until their successors shall have been legally appointed and qualified. That three members of said Board at any regular, called, or adjourned meeting shall constitute a quorum for the transaction of business. That any vacancy which may occur in said Board by reason of death, resignation, or otherwise, shall be filled by the Governor for the unexpired term.

SEC. 2.—Be it further enacted, That immediately and before entering upon the duties of said office, the members of said Board shall take the oath prescribed by the constitution of the State for State officers, and shall file the same in the office of the Secretary of State, who, upon receiving the said oaths of office, shall issue to each of said examiners a certificate of appointment.

SEC. 3.—Be it further enacted, That immediately after the appointment and qualification of said Examiners, they shall meet and organize as a Board of Pharmaceutic Examiners, elect a chairman, and adopt such rules, regulations, and by-laws as they shall deem necessary to carry into execution the provisions of this Act.

SEC. 4.—Be it further enacted, That said Board shall meet at least once every twelve months at such place as a majority of the Board may determine, and that the Board may also hold special meetings as frequently and at such places as the proper discharge of the duties shall require; the same to be convened by order of the Chairman, and the rules or by-laws shall provide for the giving of proper notice of the time and place of all such meetings to the members of the Board, and to the public.

SEC. 5.—Be it further enacted, That it shall be the duty of the said Board to grant licenses: 1st, To pharmacists, who, after three years' experience in a drug-store, kept by a licensed apothecary or pharmacist, have graduted in a college of pharmacy acknowledged by the American Pharmaceutical Association, and who shall exhibit to said Board a diploma of the same. 2d, To pharmacists who have obtained a diploma from an authorized foreign college

or institution, or examining board, and who shall exhibit the same to the Board of Pharmaceutical Examiners. 3d, To physicians who are graduates of a regular medical college, and who shall exhibit their diplomas to said Board; also to druggists who shall produce to said Board satisfactory evidence of having been engaged in the drug business for a period of ten years next preceding the time of application; also to druggists who have attended a college of pharmacy acknowledged by the American Pharmaceutical Association, for at least one term or session, and who have been engaged in the drug business for at least nine (9) years previous to the time of applying for said license. 4th, To druggists who, after three years' experience in a drug-store, kept by a licensed apothecary or pharmacist, shall have passed a satisfactory examination before said Board of Pharmaceutic Examiners. All licenses granted shall be signed by a majority of the whole Board, and shall specify the ground upon which said license is granted, and shall be in such a form as the Board shall prescribe.

SEC. 6.—Be it further enacted, That all persons applying for examination and license, shall pay to the Board of Pharmaceutic Examiners the sum of fifteen dollars, and if passing the examination shall be furnished with the license as hereinbefore provided, for which no further fee shall be required or paid. Should the applicant fail to stand a satisfactory examination, no fee shall be required for a subsequent examination, such subsequent examination not to be granted within six months after the first. And it shall be the duty of the Board to keep a record of its transactions in a book to be kept for that purpose, by one of its members, said book to be turned over to their successors in office.

SEC. 7.—Be it further enacted, That all persons now lawfully engaged in the compounding and vending of medicines, drugs and poisons in this State, shall, on or before December 1st, 1881, and every person who shall be hereafter duly licensed under the provisions of this Act, shall, before engaging in any business under said license, register in the office of the ordinary of the county wherein he resides, or intends to conduct said business, in a book to be kept for that purpose, by said ordinary, his name, nationality and credentials, and date thereof, under which he is entitled to engage in such vocation. For each registration the ordinary shall receive fifty cents, to be paid by the party so registering, and a certificate of such registration, stating the terms of same, shall be given him by said ordinary

SEC. 8.—Be it further enacted, That no person shall engage in the compounping or vending of medicines, drugs or poisons, within this State, without a full compliance with this Act, except (1) such druggists as are exempt from the operations of the present law by the statutes of the State of Georgia, and such druggists as have heretofore obtained license, and are legally authorized by existing laws to compound and vend drugs, poisons, and chemicals; (2.) Physicians putting up their own prescriptions, and dispensing medicines from their own office; (3) Merchants selling family medicines not poison, as prescribed and allowed by section 1,409 of the Code of 1873, of Georgia; (4.) Assistants in drug stores where the manager has complied with the requirements of this Act.

SEC 9.—Be it further enacted, That any person who shall violate the provisions of either of the two preceding sections of this Act, or shall register fraudulently, shall be guilty of a misdemeanor, and upon conviction shall be punished by fine, not to exceed one hundred dollars, imprisonment, not to exceed three months, either or both, at the discretion of the Board. In all cases of prosecution under this Act, the burden shall be upon the defendant to show his authority.

SEC. 10.—Be it further enacted, That all the fees for examination and license, and one-half of the fines collected from convictions under this Act, shall be paid to the Board of Pharmaceutic Examiners, to defray the expenses of the same, and as compensation for their services

SEC 11.—Be it further enacted, That this Act shall take effect from and after the date of its passage.

SEC. 12.—Repeals conflicting laws

Approved, September 29th, 1881.

APPROVED by the General Assembly of Georgia, September 29th, 1881, the Governor has made the following appointments under this act: Edward Barry, Augusta; John Ingalls, Macon; I. S. Pemberton, Atlanta; Osceola Butler, Savannah; I. Zacharius, Columbus. At the request of the Governor, they met in the city of Atlanta on the 9th inst. for organization, electing Edward Barry chairman. They will convene in the city of Atlanta on the 13th of December for the purpose of examining applicants and granting licenses under this law.

The Massachusetts College of Pharmacy.—The quarterly meeting of the Massachusetts College of Pharmacy was held on the first of December. To fill vacancies occurring since the annual meeting, Mr. Charles H. Price, of Salem, Mass, was elected Auditor, and Prof. B. F. Davenport, M.D., Registrar.

Within six months, the College membership has more than doubled. The school is in a flourishing condition (over one hundred pupils attending the present session). The fourth department of analytical chemistry, which is now a part of the compulsory course of studies, is no longer an experiment, but holds its fair share of popularity.

Willis G. Tucker, M.D., of Albany, N. Y., has recently been appointed as one of the State Analysts under the Food and Drug Adulteration Act.

College of Pharmacy of the City of New York.—The conversational meetings of this college, which have been very successful and interesting during the present session, will be continued during the first months of 1882. They will be held on the third Thursday of the month at 8 P.M., and reports of whatever may be of interest will be published in this journal.

Dr. George Bentham, the well-known botanist and co editor of the *Genera Plantarum*, recently died in the south of France, aged eighty years.

Hiccough, Remedy for.—Dr. M. S. Leslie, of Lexington, Ky., says that the best remedy in ordinary hiccoughs is about twenty-five grains of common table-salt placed in the mouth and swallowed with a sip of water.

PHARM. CALENDAR FOR JANUARY.

N. B.—The officers of Societies, Colleges of Pharmacy, Pharm. Associations, etc., will oblige us by forwarding schedules of their meetings, lists of officers, and any changes that may be desirable.

Date.	Society Meetings.
Mon. 2d.	Erie Co. Pharm. Asso.—Meet at Buffalo.
	Pittsburg Coll. Pharm.—Quart. Meet.
Tues. 3d.	Philadelphia Coll. Pharm.—Trustees' M.
	Davenport (Iowa) Pharm. Asso.—Quart. M.
	Maryland Coll. Pharm.—Trustees' M.
Thurs. 5th.	Louisville Coll. Pharm.—Pharm. Meet.
	Massachusetts Coll. Pharm.—Trustees' M.
	New York Coll. Pharm.—Trust. Meet.
Frid. 6th.	Cleveland Pharm. Asso.—Bi-monthly Meet.
Mon. 9th.	Rhode Island Pharm. Asso.—Annual M. at Providence.
Tues. 10th.	Pittsburg Coll. Pharm.—Trust. M.
	Chicago Coll. Pharm.—Trust. M.
	St. Louis Coll. Pharm.—Pharm. Meet.
	Kings Co. Pharm. Soc.—Meet. at Brooklyn.
Wed. 11th.	Cincinnati Coll. Pharm.—Annual Meet.
	New York Coll. Pharm.—Alumni Meet.
Thurs. 12th.	Newark Pharm. Asso.—Meet.
	California Coll. Pharm.—Annual Meet.
	Louisville Coll. Pharm.—Direct. Meet.
	Philadelphia Coll. Pharm.—Pharm. Meet.
	Maryland Coll. Pharm.—Annual. Meet.
	New York. German Apoth. Soc.—Annual M.
Mon. 16th.	Rock Co. (Wisconsin) Pharm. Soc.—Meets at Zanesville, Wis.
Tues. 17th.	St. Louis Coll. Pharm.—Trust. Meet. and Alumni Meet.
	Philadelphia Coll. Pharm.—Pharm. Meet.